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Position of Tensile Tests in the Foundry

Checking Metal, Melting and Molding Practices and Questions of Design with Special Reference to Aluminum Work

BY W. A. GIBSON*

IN the past considerable doubt has been expressed as to the value of tension tests in a foundry. This doubt has arisen because of the fact that the same metal composition may give widely varying properties in a casting and also because of the fact that the properties of many test bars are widely different from the properties obtained in the castings made from the same heats. Doubt as to the value of a tensile test because of these apparent inconsistencies is caused by ignorance of the purposes for which such tests are made.

These purposes may be subdivided into three main divisions as follows:

1—To check up metal and melting practice.

2—To check up molding practice.

3—To give assistance in design.

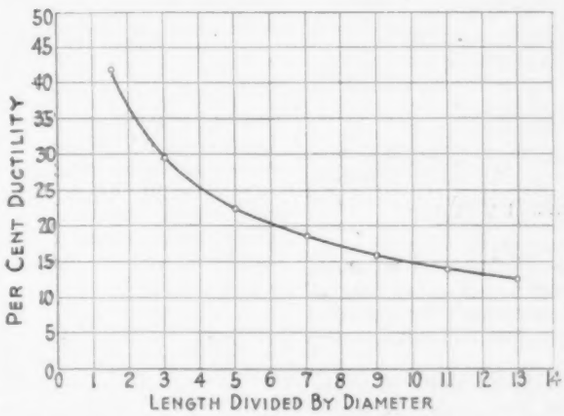
A large number of people believe that the main purpose of a tensile test is for the third item given above, namely, to give assistance in design, when by far its greater value is for the first and second purposes and more especially for the first. The first and second purposes might be grouped into one, but the variables in the molding are so many that usually they are kept separate and the tensile test is depended upon mainly to check up the metal and melting practice.

In order to check up metal and melting practice, it is therefore necessary to standardize very carefully the methods of testing and of casting in order that results obtained in one foundry may be comparative with results obtained in another, or that tests made one day may be compared with those made at another time. Variations caused by methods of testing may occur due to choice of section or to methods of operating the testing machine. The American Society of Testing Materials has done much to standardize the size of section.

Errors Due to Choice of Section

The standard test bar as specified by the American Society of Testing Materials on page 248 of their 1918 standards, consists of a 2-in. gage length ½ in. in diameter with ends to fit the testing machine. A radius of not less than ⅛ in. joins the gage length to the ends which are usually ¾ in. in diameter. This is the standard steel specimen for automobile work and has been adopted as the standard in cast aluminum, with which this paper is mainly concerned. The diameter on a machined specimen is made 0.505 in. for the reason that this gives an area of almost exactly 0.2 sq. in., thus facilitating computations in the formula: Stress equals load divided by area.

The 2-in. length was arrived at because of the variations in ductility which occur as the ratio of length to diameter is varied. This is more important in ductile materials than in brittle. For example, the curve reproduced shows the way in which the ductility may be made to vary in a mild steel as the ratio of length to diameter is changed. All these tests were taken from the same bar of steel so that the material was as near uniform as possible. The curve shows that the ductility may be made to vary from 42 per cent down to less than 12 per cent by changing the above ratio. This brought about a standardization of 4 for the ratio of length divided by diameter of test section. It also frequently led to the use of the per cent reduction of area in specifying the ability of a material to withstand deformation. The error is greatest in a material which is subject to a large and localized reduction of area. Since cast aluminum alloys are but very little subject to this "necking," this ratio is not as important in aluminum as in steel, but is maintained in order to follow the general practice in obtaining ductility measurements.



Relation of Ductility to the Ratio of Length to Diameter in Tension Tests of Structural Steel

Under ideal conditions all bars should be tested using threaded ends turned in the lathe and with self-aligning adapters. In this case the centering should be done upon the test section and not upon the threaded ends of the bar. In other words the thread must be concentric with the test section. In many cases it is not practicable to thread bars and the use of jaws must be resorted to. If a testing machine is in perfect alignment, the use of jaws introduces but very little error. The trouble is that it is never certain just when a machine is out of alignment and the error caused by the use of jaws is therefore a variable one, varying from zero in some cases to as high as 100 per cent. In the majority of cases it will be close to 5 per cent. Frequently such an error is not objectionable, but any person using the data should always have this element of uncertainty in mind. Where a close comparison upon which much may depend is desired, threaded ends must be used if slight differences are to be detected.

Flat test bars are even more objectionable than the

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round from the point of accuracy. It is an exception when a jaw can be made to grip a flat bar evenly across the entire width of the piece. The amount of error that may be introduced in a test of a brittle or semi-brittle material by this eccentricity is almost unbelievable. In one example, a flat test bar pulled under the best conditions possible, an eccentricity of one hundredth of an inch introduced an error of 3000 lb. per sq. in. into a total strength of 18,000 lb. per sq. in., thus causing the apparent strength to be 15,000 lb. per sq. in. This was under the best conditions. The possible, and even the probable error, is much greater.

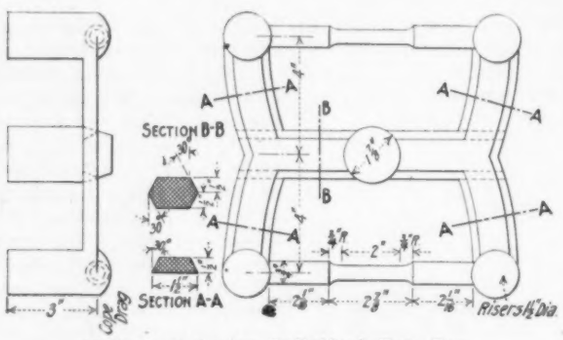
Errors Liable in the Testing Machine

The errors due to the testing machine itself are:

1.—Machine out of balance.
2.—Wrong ratio of lever arms.
3.—Lack of alignment.
4.—Method of balancing beam.

The first error is one which can easily be corrected by the operator. The second will probably be negligible with any standard type of machine and can only be checked up by means of a calibration which may be done by any of the well-known methods.

The third, lack of alignment, is liable to occur at any time due to shifting of the table on the knife edges, sticking of the jaws, etc. As long as jaws are used it is never certain just how much of this error is introduced. The only way to eliminate it is to use spherical adapters and threaded ends. Under non-alignment would come errors in machining. If threaded ends are used the centering must be done upon the test section and not upon the ends.



Method of Gating Individual Test Bar

The fourth error is one which is entirely due to the operator. The amount of error which may be introduced by a dishonest operator, especially with a machine whose capacity is far in excess of that necessary, is almost beyond belief. All of these errors in testing can be avoided easily if proper care is taken.

The Effect of Variations in Pouring

Variations in the method of casting are much harder to take care of and it is very seldom that test bar results from one company are exactly comparative with those from another. In fact, frequently those from one plant of the same company are not entirely comparative with those from another plant. An attempt has been made by the Aluminum Manufacturers, Inc., to eliminate this variation by the use of a standard test bar pattern.

This pattern as developed by the Lynite laboratories of the company is shown in the accompanying line drawing. This method of casting was adopted for two reasons:

1.—It gives as near uniform conditions as possible, as it is very nearly independent of the speed of pouring.
2.—It gives a good quality of casting. It accomplishes this in two ways.
(a)—The metal enters the test section from opposite ends at the same time after which the risers are filled. This gives quiet metal in the test section at the time of solidification and also causes the risers to be filled with hotter metal than the test sections themselves, thus making certain that the test section will be solid long before the riser has solidified.
(b)—The path of the metal from the sprue to the casting is long, giving a good chance for the dross to float toward the top of the runner and into the riser.

For the sake of speed this pattern is usually put on a match plate and a large number of molds may be made by one molder. Since the gating is included in the pattern itself all variations due to the gating are eliminated. In order to eliminate variations due to ramming of the mold, the use of a squeezer is advisable. This method of casting has given extremely uniform results and is considered by the writer as the best possible one to use in checking metal and melting conditions in aluminum.

In addition to standardizing the method of molding, it is vitally necessary to standardize the temperature of pouring. This effect is well shown in Table 1 which gives the effect of various pouring temperatures upon the standard No. 12 alloy containing 8 per cent copper, balance aluminum.

Table 1—Effect of Pouring Temperatures

Sample Number	Pouring Temperature	Break	Per Cent Elongation
1827–*M*	1,300	19,883	1.8
1827–*N*	1,400	20,120	1.9
1827–*O*	1,500	19,831	1.2
1827–*P*	1,600	17,404	1.3
1827–*Q*	1,700	17,020	1.4

From these values it is evident that in order to compare the qualities of metal and the correctness of melting practice, it is necessary to keep this temperature very constant. The values given are for No. 12 alloy which is much less sensitive than some of the other more special alloys, which are now beginning to be used.

Variations of Properties Due to Molding

It must be borne in mind, that by this method of making test bars no check whatever is made upon the molding variables. The standard test bar checks up the history of the metal up to the time it goes into the mold. If the molding is improperly done, the only way to determine this is to take the casting itself, cut it up into parts and take tests from various points throughout its section. Several examples in which this has been done are given in Tables 2, 3 and 4.

Table 2—Variation in Physical Properties Obtained at Various Points Throughout an Aluminum Crank Case Used in a Well Known Airplane Engine

Location	Break	Per Cent Elongation
Thrust bearing near propeller end...	28,550	2.67
Web supporting crankshaft bearing.	22,600	2.76
Lugs for attachment to frame.....	17,400	2.00
Wall at transmission end of case....	22,600	2.00
Crankshaft bearing	19,900	2.27

(Each value is the average of five tests.)

Table 3—Variation in Properties Throughout the Section of a Bronze Worm Gear Made for a Widely Used Automobile Axle

Location	Yield Point	Tensile Strength	Per Cent Elongation	No. of Tests
Outside edge of rim..	25,806	44,546	19.58	12
Center of rim.....	24,505	34,810	7.91	12
Inside of rim, edge.	23,024	27,723	5.22	12
Lug	23,298	26,394	4.37	3
Specimens 1–15.....	24,527	35,541	9.53	15
Specimens 1*a*–15*a*...	23,823	32,336	9.91	15
Specimens 1*b*–15*b*....	24,490	34,136	9.86	15
Rim opposite lug....	23,955	35,246	10,75	18
Rim between lugs...	25,092	36,101	11.37	18

Table 4—Variations Throughout Various Sections of a Cast Aluminum Truck Wheel

Locations	Yield	Break	Per Cent Elongation	Charpy Impact
Outer edge of rim..	10,337	18,697	5.9	2.12
Inner edge of rim..	11,650	18,572	5.2	2.00
Web	11,772	16,448	3.5	2.25
Outer edge of hub..	13,225	17,122	5.0	...
Inner edge of hub..	13,630	17,992	3.7	2.69
Webs at rim.....	9,899	17,940	4.5	2.44

These tables, especially Table 2, show that it is possible to check design and molding practice by means of tensile tests. For example, in Table 2 the gates have been attached to the engine lugs, which should be the strongest part of the casting. This test showed

that this method of gating was improper and a change was immediately made.

Castings made with molten metal from a given heat may have better or worse properties than a test bar made from the same heat.

Test bars cast from the same heat as the casting whose results are given in Table 1 tested 24,500 lb. per sq. in. No figures are available on separate test bars from the heat used in making the casting of Table 2. The individually cast bars from the same heat as that used in making the cast aluminum truck wheel of Table 4, gave a tensile strength of 20,000 lb. per sq. in.

Unless the molding practice and design is perfect, a casting will vary from point to point throughout its sections as shown in the above tables. These variations are due to several reasons.

1.—Shrinkage.
2.—Gating.
3.—The personal element in foundry work.
4.—Poor design.

Reasons for Variations in Castings

Nearly everyone is familiar with the pipe in cast steel ingots. In some cases it is necessary to crop, that is, saw off and scrap, 15 per cent of the length of an ingot in order to avoid this pipe. This piping is caused by the fact that molten metal occupies more volume than the corresponding weight of solid metal. There are a few exceptions such as the so-called type metals containing antimony. This shrinkage from the molten to the solid state is the greatest cause of weak sections throughout castings. If one part of the casting is solid much before the other, the first part will then shrink and be fed up by the second, leaving insufficient metal to supply this second part. This will then be left spongy and weak. This can be eliminated in two ways: The gating may be so arranged that when the mold cavity is full the length of the path over which the metal has traveled will have been such that the heavy sections will be filled with colder metal than the thin sections. Due to mechanical difficulties this has a very limited application. It will be considered later under gating.

Risers may be used which are attached to the last part of the casting to solidify. These risers must be so located and of such a size that they will remain molten longer than the casting, otherwise they simply act the same as the first section mentioned and increase the sponginess of the casting at the point of attachment.

The gate of a casting should be arranged so as to automatically skim the metal. This is more important in the iron and brass than in aluminum castings because of the greater amount of dross with the first two metals. However, it is important in all. The problem of shrinkage may frequently be very much helped by gating. This can be done by so arranging the gates and the distance the metal has to pass through the mold before arriving at its final destination so that all parts will solidify at the same time. Proper gating of a casting is one of the fine arts of present day manufacturing processes. In gray cast iron the shrinkage is so small that this is not a serious problem, but with the high shrinkage metals such as brass, bronze, aluminum and magnesium, it requires a high degree of intelligence and thought.

By personal element is meant care taken in melting and molding practice throughout the foundry. In other words, good or bad workmanship. It is the largest item affecting quality of product, but will not be considered here as it is beyond the scope of this paper.

Attention to Design

In a low shrinkage metal like gray cast iron, it is frequently possible to cast a large section near a small one or to reduce a fillet to a minimum. However, this is bad practice even in that metal and always leads to bad results in brass or aluminum. As an example of the results of care in design, attention is called to the uniformity of physical properties maintained in the tests given in Table 4.

Considering Tables 2, 3 and 4, from the above discussion, Table 2 shows especially the effect of poor molding practice and of poor design. The lugs attached to the frame, the third item given under Table 2, show a tensile strength of 17,400 lb. per sq. in., which is at least 5,000 lower than the average and 11,000 lower than the maximum. This difference is explained when it is known that not only were the engine lugs much heavier than the parts of the casting to which they were attached, but also the gates were attached to these lugs. All the metal going into the mold therefore passed through this part of the cavity, warming it up and causing it to remain molten longer, thus causing shrinkage to occur in it as well as a very slow crystallization. After this series of tests the gating was moved to another part of the casting and much better results obtained.

The value of 28,550 lb. per sq. in. taken from the thrust bearing near the propeller end was caused by the fact that this part of the casting was a long distance from the sprues giving the metal a good skimming action as well as allowing it to be very cold when it reached this section. In addition this part of the mold filled up very quietly giving ideal conditions for high quality of material. Corresponding test bars were poured in individual molds from the same heat, the gating being similar to what would occur in the line drawing shown, with the center runner left off and one of the risers used as a sprue. These test bars gave a value of 24,500 lb. per sq. in. This comparison is interesting, in that it shows the harmful effect of a stream of metal being allowed to pass through a mold cavity, thus heating it up before the metal in it is allowed to solidify.

The web supporting the crankshaft bearing and the wall at the transmission end of the case were of the same thickness and about the same relative position in the mold. This is well shown in their tensile results. The crankshaft bearing which has an average tensile strength of only 19,900 lb. per sq. in. was about twice as thick as the parts of the casting adjoining. This difference in section was partially compensated by the use of risers attached to the crankshaft bearing. However, as can be seen, these risers were not fully able to compensate for the weakness in the design.

In Table 3 attention is called to the difference between the tensile strength and the per cent elongation of the lug and of the outside edge of the rim together with the graduation from one to the other. A cast-iron circular chill was used at the outside edge of the rim causing the freezing to be progressive from the outside toward the lug. This is well shown in physical properties.

Table 4 is introduced to show how nearly uniform results can be obtained when proper attention is paid to the design and to the gating. In the design of this casting particular attention was paid to the elimination of heavy sections. In the molding of it the gating was given very serious thought, and the arrangement of gates, chills and risers was the result of long experiment. This is well shown by the uniformity of physical properties. The weakest section, the web, has long been a difficult point in any wheel casting. The close approach of this web to the physical properties of the rest of the casting is a tribute to the care taken in molding, gating and pouring.

Molding Variables Eliminated From the Test Bar

It may be asked how it is possible to check up metal and melting practice without bringing in at least a part of these molding variations. In answer to this question the standard test bar is an almost ideal section in which it is very easy to obtain perfect feeding and skimming. In addition the shape is such that there are almost no cooling stresses left in it. No matter how carefully we attempt to standardize the molding conditions there are a few variations from this source introduced and we can only keep them to as much of a minimum as possible. As stated before, the method of gating shown in the line drawing almost entirely eliminates these variations.

In contrast to the test bar section, the average commercial casting is so complicated that perfect feeding and gating is mechanically impossible. The only thing which can be done is to approach as closely as possible perfect conditions. The greater the skill and intelligence of the man first laying out the job for production, the more nearly these perfect conditions will be approxi-

mated. The fact that the difficulties in his way are largely mechanical rather than scientific should not minimize the importance of his work or the high degree of intelligence required for it.

Function of Tensile Tests in Design

The third reason for carrying out physical tests would be to give assistance in design by furnishing data as to the mechanical strength of materials. There are very few cases where it is possible to compute the actual loads which a machine part has to stand. An example of this is the discussion which is constantly going on as to the proper method of computing stresses in the crankshafts of automobile and aeroplane engines. This doubt as to the amount of load acting on even a comparatively simple machine part is usually much greater than the doubt of the quality of the material entering into it or of the formulæ used for computing the stresses after the load has once been determined.

The only way to tell with certainty how any part will act in service is to actually put it in service and run it to destruction. Naturally, this is a long and expensive process and impossible in any but a very few cases. Therefore, we frequently are confronted with the so-called imitation tests in which a machine part is given an accelerated test under as nearly as possible the same conditions as those that would be obtained in practice.

The question of imitation tests has recently been discussed in an article in *Automotive Industries* of Sept. 11, 1919, by Dr. Walter Rosenhain in which he says, "First, that in order to obtain definite and reliable results which have a meaning capable of definite quantitative interpretation, we should seek to make our mechanical test as simple as possible, seeking to measure one physical property or constant at a time, and avoiding the snare and delusion of the 'imitation' test. Second, that we should seek to express our opinion of the relative importance of the various mechanical properties or constants in terms of definite 'figures of merit' which can be tested by comparison with service results."

While not going as far as Dr. Rosenhain in condemning the imitation test, the writer believes that a wide experience with materials and with machine parts as well as a thorough knowledge of mechanics of forces is necessary to either plan or interpret such tests.

Test bar results most certainly should not be used blindly in designing. Frequently, however, the difference between test bar results and the properties of the casting, such as are shown in Table 2 and in Table 4, are allowed for in a factor of safety. When a factor of safety is given to cover this difference, considerable errors are liable to arise on either the safe or the unsafe side. The use of a factor of safety on test bar results without a proper appreciation of the limitations of such data has done much to give the "factor of safety" the title "factor of ignorance." In order to use test bar results intelligently in machine design it requires not merely a wide knowledge of the mechanics of the distribution of stresses, but also a considerable experience of the way in which the properties of materials vary in different sizes and shapes of castings.

Cincinnati Metal Trades Meeting

The annual meeting of the Cincinnati branch of the National Metal Trades Association was held at the Business Men's Club in that city, on March 4. Officers for the ensuing year were elected as follows: President, J. B. Doan, American Tool Works; vice-president, J. W. Carroll, Lodge & Shipley; treasurer, H. C. Hoefinghoff, Cincinnati Grinder Co.; secretary; D. C. Jones, Lunkenheimer Co.; executive committee, R. T. Hazleton, N. C. Lamont and A. B. Breeze. J. W. O'Leary, Chicago, president of the National association, and H. H. Merrick, of the Great Lakes Trust Co., Chicago, were the principal speakers, Mr. O'Leary giving a detailed account of the proceedings of the first industrial conference at Washington, of which he was a member, and Mr. Merrick reviewed conditions as they exist in the industrial world to-day, paying particular attention to what he considered the iniquitous excess profits tax.

Defects in Steel Revealed by Acid Etching

WASHINGTON, March 9.—Results of experiments of the United States Bureau of Standards to determine defects in steel are described in a report by Henry S. Rawdon and Samuel Epstein. An abstract of this report, which has just been completed, follows:

The deep etching of steel by means of concentrated acids, that is, hot concentrated hydrochloric acid is a very important means of revealing the structural condition of such material. The features revealed may be of three types: Chemical, such as heterogeneity, due to segregation, to composition changes accompanying welding, carburization and similar processes, to lack of solution and uniform distribution of special addition elements in alloy steel, etc.; mechanical, such as initial stresses, due to preliminary mechanical and thermal treatment; physical, such as internal fractures and the similar discontinuities within the metal.

Steel, which is heterogeneous in its chemical composition, shows a characteristic roughened surface when etched, corresponding to the variations in composition. This roughening is due to the greater solubility of certain portions, particularly the non-metallic inclusions, sulphide, oxide, etc., and to the deepening and widening of the pits resulting upon the removal of these inclosures.

As specimens typical of highly stressed material, hardened steel balls were used. The stresses, due to the mechanical and thermal treatment the balls had received, were often of sufficient magnitude to cause the balls to crack spontaneously when subjected to the action of concentrated acid. The behavior of steel in this respect is identical with the corrosion-cracking of brasses and bronze under certain conditions.

Physical discontinuities, which may exist within the steel, usually occur as tiny cavities or pores, giving rise to spongy metal, which is quite readily detected. Certain discontinuities are of the nature of internal fractures, the metal being still in such intimate contact, however, that they are detected only with extreme difficulty. This type occurs rather abundantly in defective rails of the transverse fissure type. Similar defects have been found in forgings, such as steel axles and tires. Deep etching reveals these internal fissures as short cracks which appear to bear a definite relation in their arrangement to the direction of the stresses to which the piece had previously been subjected.

The presence of these defects in steel, previous to etching, has never been demonstrated by previous investigators, due to the lack of a suitable method. Hence various conflicting opinions have been held as to their nature and the seriousness of the defect. In order to show the presence of such internal cracks, a special magnetic method was used. The specimen was polished as for microscopic examination and, after magnetizing, was bathed in a suspension of fine iron dust in kerosene. Discontinuities in the metal were clearly shown by the arrangement of particles of iron dust along their course. Subsequent etching tests showed that each crack revealed by the etching is due to the widening and deepening of a pre-existing internal fracture in the steel. These defects are essentially fractures circular in area, which occur across what is otherwise sound metal. By suitable means the metal may be opened up along the line of the defect showing that there is a definite discontinuity within the metal and no coherence at all. These areas are identical in appearance with the starting point of the very serious defects known as transverse fissures in rails.

O. F. S.

Waste Material Dealers in Annual Meeting

The activities of the newly-formed scrap iron division will be a feature of the annual meeting of the National Association of Waste Material Dealers, Inc., at the Hotel Astor, New York, March 15 to 17. This division will meet at the Hotel Astor at 3.30 p.m., March 16. First a chairman will be elected to serve a year. Consideration will be given to the advisability of asking the Interstate Commerce Commission for a formal ruling in reference to the shipment of machinery, boilers, etc., under the classification provided for scrap iron. A traffic attorney will be present to give advice. The metal division will meet at the same hotel at 2 p.m., March 15. The seventh annual banquet of the association will be held at the hotel at 7 p.m., March 17.

The National Marine Exposition will be held at the Grand Central Palace, New York, April 12 to 17. The exposition will be opened by Secretary of Commerce Alexander and Secretary of the Treasury John Barton Payne.

Pots and Boxes Used in Carbonizing*

Cast Steel as Compared with Cast Iron — Special Alloys as Materials—Cost per Heat Hour

BY H. H. HARRIS

WHILE heat-treating furnaces have been developed consistently for more than a quarter of a century and the heat-treating processes in their present scope of applications are practically an outgrowth of the automobile industry, no new process of carbonizing has been developed which eliminates the use of carbonizing boxes, with the exception of the gas carbonizing process for small parts and certain foreign developments in gas muffle carbonizing. Cyanide and lead hardening processes have changed very little and pots similar to those used 20 years ago are employed in the most modern practice.

Three factors govern the service received from pots and boxes. They are: Design, methods of manufacture and material.

Variations in Design

In certain large manufacturing plants there has been considerable improvement in the design of pots and boxes. Through the industry at large, however, a great majority of carbonizing boxes are of a design as well adapted for packing soap in as they are for carbonizing. The patterns are generally made by the handiest fence carpenter without a blueprint or a draftsman, unskilled in such matters, makes up a drawing of a carbonizing box, his only interest being the width, depth and length, without regard to how the box is used in the heat-treating process or the foundry methods required in making it. Frequently the dsign is left to the foundry, who knows as much about heat-treating as the average heat-treater knows about molding practices and the blowing of steel. The foundry's chief interest is to make the box heavy so that it will weigh more and can be manufactured with less care in molding.

These practices insure poor design and consequent poor results. The life of a box is as much dependent upon design as upon analysis of material. Boxes can be designed to largely eliminate warping. Special design is necessary to facilitate handling the box, that is, taking it in and out of the furnace.

Flanges, covers and methods of sealing are highly important and come under the head of design. A box must be designed to permit tight sealing with some refractory or other material, yet without the clay being permitted to enter the box and mix with the compound. Boxes must also be designed as regards their inside dimensions, with a view to the work which is to be carbonized, and a knowledge of how the materials within the box should be packed, the quantity of carbonizing compound required, etc. The outside dimensions of the box must be made to conform with the size of the furnace, and be of such size as to permit the largest possible production of work from a given size of furnace.

The thickness of the box must be as thin as possible to prevent warpage and still must be thick enough to permit proper flow of metal in casting. In this a knowledge of both heat-treating and foundry practice is necessary. Many foundries who know nothing about heat-treating practice and not too much about foundry practice are attempting to advise the heat-treating engineer as to the design of boxes. I do not know of a foundry to whom I would entrust the design of a carbonizing box. One of the alloy manufacturers specializes somewhat on design but is limited considerably because of the manufacturing difficulties with this material and their experience in design is, of course, confined to boxes and castings employing the one metal only.

Materials for pot and box manufacture may be briefly grouped under six classifications: Cast iron, cast steel, pressed and wrought steel, "trick" materials, alloys, and any of the first four calorized, or treated by the calorizing process.

Cast Iron as a Material

The cheapest first cost material obtainable has a fault common to most of the cheapest made—it is the poorest. Cast iron oxidizes very rapidly, is inclined to be very porous and allow leakage, and gives a very non-uniform service. Cast iron grows or expands under heat and does not contract. Carbonizing boxes frequently become so distorted that their tops do not fit and they leak gas and carbonizing material, becoming generally unsuitable for use. They also frequently scale on the inside if a small amount of oxygen is present when the box is sealed, the scale becoming mixed with the carbonizing compound giving generally poor results and sometimes spoiling the work entirely. Cyanide and chloride attack cast iron a great deal faster than they do steel or the alloys, and steel gives much better service under lead conditions than cast iron.

Cast Steel Boxes

Cast steel is generally much superior to cast iron. It costs about twice as much per pound but many times longer service can, as a rule, be expected. The principal objection to cast steel is that the grade of steel used for pots and boxes is generally of inferior quality, sometimes even semi-steel being offered for steel. As most foundries sell pots and boxes at comparatively low prices, they run them from their lowest grade steel or the tail end of the ladle, making poor castings. Steel castings do not offer the ease of cast iron practice in manufacture. Better molding is required and great care must be taken to exclude foreign matter, such as sand, slag, refractory material, etc., from the metal.

There is a large percentage of steel castings scrapped and a larger per cent patched up and sent out which should be scrapped. Sand and slag inclusions, blow holes, cold draws and cold shuts are common defects in steel castings. Poorly made castings are inclined to be very porous, allowing uneven scaling and frequently leakage when used as containers for lead or cyanide. This can be largely overcome by extra care in manufacture and close inspection. Also to a considerable extent by close regulation of the composition of the metal, without affecting the price to an appreciable extent.

Steel pots and boxes now in use are mainly cast from ordinary steel or steel intended for miscellaneous castings. This class of steel will stand much improvement. A great many of the steel boxes used in the automobile industry are produced by the foundries in the Detroit district, whose product in the past has been far from uniform, due to poor molding, bad inspection, etc., brought about by labor troubles. The Eastern foundries as a whole turn out a more uniform quality of steel than foundries in the Detroit district and have better inspection. Their prices are a little higher, but I believe are warranted by the quality of the product.

So far, judging from an average of various tests and conditions studied in many of the largest plants in the country, I do not believe any material has shown on the average a uniformly longer life per dollar investment than cast steel, with the exception of one

*From a paper presented at the January meeting of the New York Chapter of the American Steel Treater's Society. The author is with the Quigley Furnace Specialties Co., New York.

which has just been commercially introduced, although tests of it have been conducted for several years. This is a special alloy known as Q-Alloy, which will be discussed later.

Pressed and Wrought Steel

Pressed and wrought steel cyanide, chloride and lead pots were quite generally used some time ago before the advance in price of this material. Its advantage is its light weight and consequent small heat consumption. Its disadvantages are its high price and the comparatively few shapes in which it can be secured. Several attempts have been made to produce satisfactory pressed steel carbonizing and annealing boxes, but have never been successful. The large majority of pressed steel pots are sold through speculative supply houses, who add a large profit, rather than sold direct from manufacturer to consumer, as cast material is sold.

I know of a few companies manufacturing their own annealing boxes from wrought steel, riveting or welding them together. Some of these are giving satisfaction in extreme temperatures but not under general conditions. These boxes are not generally suitable for carbonizing. Very few are used as they do not hold gas and have a short life because of the minimum thickness necessitated by their construction. Wrought steel riveted or welded pots for cyanide, chloride or lead conditions have never been successful, owing to leakage.

Trick Materials

Under "trick" materials come the products of all firms who misrepresent their product or sell it under a trade name which does not correctly indicate its nature. For instance, a very poor grade of cast iron containing a small amount of silicon is sold as a "special heat-resisting metal" at a price several cents above its value. Some companies are melting down shell blanks with scrap in the cupola and selling the resulting semi-steel as a "high heat-resisting steel." Some foundries pour their regular run of steel used in making miscellaneous castings, from tractor wheels to window weights, into pots and boxes, yet advertise the pots and boxes as "made to resist high temperatures under furnace conditions" and sell them under a trade name implying that they were some special quality steel.

Pots Made of Alloys

Alloys for heat-resisting purposes are a comparatively new development. Although there have been several very high-priced alloys manufactured for several years as platinum substitutes and the like, the first patent covering a heat-resisting metal to sell at less than $5 per lb. was issued in 1916. This was issued to John C. Henderson, Washington, D. C., and assigned to the Driver-Harris Co. A later patent issued to Mr. Henderson in 1918 covers the manufacture of carbonizing boxes using the same alloy. These patents are not sufficiently broad to cover a fraction of the alloy field and are only the first step in the development of the carbonizing and annealing box alloys. Several steps have been taken since and from all indications the matter is still in its infancy. At this time there are more than 35 patents covering heat-resisting alloys.

The analysis of several alloy materials manufactured under patents and otherwise is given in the table.

A Nickel-Chromium Alloy

The latest development in the alloy field is a special nickel-chromium alloy, the analysis of which I am not yet authorized to divulge. This material differs from nickel-chromium alloys on the market in that it retains many of the physical characteristics of the cold metal at a temperature of 2800 deg. Fahr., and rings like a bell when struck with a hammer at this temperature. It does not warp and is guaranteed against cracks and blow holes. As every heat of this material is carefully checked for uniform analysis, and as its manufacturing practice is highly standardized, any two boxes will show approximately the same number of heat hours in service under equal conditions. This is not generally true of other alloys on the market which, as a rule, are far from uniform in service. This may be due to the fact that some of them are made from machine scrap containing copper and other elements not calculated to improve the quality of the metal. While far superior to ordinary alloys in many ways, this material is no higher in price than that generally asked by competitive manufacturers. This material can be also rolled and supplied in sheet form suitable for fabricating sheaths for the application of retorts, muffles, annealing pans, etc.

This new alloy is known as Q-Alloy, Grade X. The manufacturers do not advocate it for the manufacture of cyanide or lead pots, as practice has found that nickel and chromium alloys do not as a rule compare favorably in service rendered per dollar investment with high grades of alloy steels for use under cyanide and lead conditions, particularly lead. Many alloy manufacturers have not always shown much discretion in recommending their product for use under conditions where it would not prove a saving for the user.

Each material is best suited for certain specific applications and should be recommended only for use under conditions where it will give maximum results.

Analysis of Alloy Materials for Pots and Boxes

		Per Cent
No. 1	Nickel	60.00
	Chromium	12.00
	Manganese	1.50
	Iron	26.00
No. 2	Nickel, approximately	33⅓
	Chromium, approximately	33⅓
	Iron, approximately	33⅓
No. 3	Nickel	0.50 to 2.00
	Chromium	13.01
	Manganese	0.75
	Silicon	1.54
	Molybdenum	3.62
	Carbon	2.59
	Iron	Remainder
No. 4	Nickel	65.20
	Chromium	16.45
	Silicon	1.48
	Aluminum	3.52
	Manganese	0.85
	Iron	11.94
No. 5	Aluminum	12.00
	Silicon	1.00
	Titanium	1.00

Nickel or chromium alloys, for instance, are not suitable for use as cyanide or lead pots, particularly the latter. The lead has an amalgamative action and tends to break down the structure of the alloy by uniting with certain elements. Steel, on the other hand, is highly unsuited for the construction of aluminum melting pots, as the steel not only contaminates the aluminum, but the aluminum makes short work of the steel pot. It is regrettable that so many companies manufacturing only one material recommend it to serve under all heat-treating conditions, as no one metal is a cure-all.

Methods of Manufacture

Granting that both design and material be right, if the methods of molding, gating and pouring are not thoroughly understood, the product is a compromise. The mold must be prepared with a full knowledge of the conditions under which the casting is to serve. The metal must be poured at the proper temperature and all impurities removed by skimming. Ample risers must be provided so that every molecule of steel is under positive pressure at the moment of solidification. Density of metal is of utmost importance. To make good pots or boxes, the manufacturer should be thoroughly familiar with heat-treating practice.

Calorized Pots and Boxes

Calorizing is a process for infusing aluminum into the outer portion of any metal article, forming a protective coating of aluminum over aluminum oxide when exposed to high temperature. This process was invented by the General Electric Co. and is controlled by the Calorizing Corporation of America. Calorizing has failed completely in many instances as applied to pots and boxes, and I would advocate its use in the heat-treating processes only as applied to rotary retorts such as used in the American Gas Furnace Co.'s rotary carbonizing furnaces, pyrometer tubes and wrought pipe for special processes. The price is excessively

high, being $1.50 to $2 per square foot of surface treated.

The Maxwell Motor Car Co., in its Detroit laboratories, conducted a test some time ago under the direction of E. W. Upham, chief metallurgist, to ascertain the value of calorizing as applied to carbonizing boxes. Four classes of boxes were entered in the test as follows:

No. 1—Calorized welded sheet steel box
No. 2—Calorized cast steel box
No. 3—Calorized cast iron box
No. 4—Uncalorized cast steel box.

The results were as follows: Boxes of Class No. 1 broke down and burned out very rapidly owing to the fact that calorizing over the welds gave way in a very short time, exposing the porous weld direct to oxidation.

Class 2—Calorized cast steel boxes stood up fairly well but calorizing burned away in spots, allowing oxidation to destroy portions of the box, thereby rendering it useless.

Class 3—Calorized cast iron box warped and "grew," breaking the calorizing, thereby exposing the cast iron beneath, causing destruction of the box by oxidation.

Class 4—Uncalorized cast steel box, oxidized uniformly, and was in fully as good condition after the completion of the test as any of the calorized boxes, but had lost more weight than the calorized cast steel box, owing to the protection afforded by the calorizing which remained intact.

This test proved calorizing of no value whatever applied to the Maxwell company's boxes, and they gave up further tests. The Tool Steel Gear & Pinion Co., Cincinnati, Ohio, conducted a test of calorized riveted sheet steel boxes which proved calorizing of little or no value under their conditions. The Brown Pyrometer Co. sold a great many calorized pyrometer protection tubes and are in a position to advise in regard to calorizing applied to this equipment. It is my understanding that they found some calorized tubes gave excellent service while others burned out after very short exposure.

Cost Per Heat Hour

The only true scale of value by which a user can judge most competitive production materials consumed in service is by comparing their life under service conditions with their initial cost, and determining how many units of service each renders per dollar investment. In computing pot and box cost a unit is a heat hour, which is an hour in the furnace under heat. Cost per heat hour is arrived at by dividing the number of heat hours received into the initial cost of the pot or box; for instance, if a cast iron box weighing 100 lb. and costing 5c. per lb. runs 100 heat hours, the cost is 5c. per hr. A steel box at 12c. per lb. should run at least 300 hr. under the same conditions, making a cost to the user of 4c. per heat hour. Under certain circumstances parallel to this Q-Alloy has been known to run 7000 hr., making a cost to the user of 2c. per heat hour. Where an alloy affords a saving in cost per heat hour it minimizes warpage and allows a thinner section to be used, thereby saving fuel in heating the box and its contents.

Thousands of tons of metal per annum are being consumed in the fires of heat-treating furnaces. This metal is paid for by companies every one of which could use the money so expended to the betterment of their product rather than writing it off in the profit and loss column and passing the tariff on to the ultimate consumer. American industry quite frequently puts up with undue waste to obtain production and perhaps the greatest waste in the metal-working industries, which can be directly attributed to ignorance and neglect, is the waste of metal consumed in the heat-treating processes. This waste can never be entirely eliminated. It may be greatly reduced.

Salisbury Iron Corporation Organized

The Salisbury Iron Corporation has been incorporated under the laws of Delaware with an authorized capitalization of $500,000 in 6 per cent preferred stock and 20,000 shares of common stock of no par value to succeed to the business and property of the Barnum-Richardson Co., Lime Rock, Conn. The new corporation has authorized the issuance of $200,000 of secured serial 7 per cent notes, of which $150,000 will be presently issued for the purpose of providing additional working capital.

The business to which the Salisbury Iron Corporation has succeeded was founded in 1734 and its principal product, Salisbury charcoal iron, is known throughout the iron trade as the highest grade of pure charcoal iron. It was from this iron that a large part of the ordnance used by the American forces in the Revolutionary War was made. Contrary to the growth in all other classes of iron production, the past 20 years has seen a marked curtailment in the output of high grade iron in which only charcoal without the addition of coke is used as fuel. The demand for this class of iron, however, is large and the comparatively small tonnage now being produced in this country is chiefly attributable to the fact that the pure charcoal iron market cannot follow the trend of large tonnage production of other grades.

The Salisbury Iron Corporation owns its own mines, foundries and furnaces. In addition to increasing its present capacity to approximately 10,000 tons of Salisbury iron per annum, it will etxend its foundry operations in the manufacture of charcoal iron castings, chilled iron castings, gray iron castings and industrial and railroad car wheels.

The officers and directors of the corporation are: Horace W. Davis, chairman of the board; William McIntyre, president; Andrew Fulkerson, treasurer-secretary. The board of directors comprise Horace W. Davis, New York; Robert Scoville, Lime Rock, Conn., and New York; William H. Barnum, New York; Edwin A. Potter, Jr., vice-president Guaranty Trust Co., New York; E. J. Boote of Finance and Trading Corporation, New York; Eugene E. Anderson, Sharon, Pa.; Harry B. McDowell, vice-president, B. McDowell, vice-president, McDowell National Bank, Sharon, Pa., and Wilbur L. Ball of Rosenberg & Ball, New York.

Aetna Foundry & Machine Co. Reorganization

The annual meeting of the stockholders of The Aetna Foundry & Machine Co. was held in Warren, Ohio, Feb. 27. The recent reorganization of the company brings men prominent in the steel industries of the Mahoning Valley into the organization as shown by the following list of directors elected at this meeting: M. I. Arms, II, president and treasurer of the Aetna Foundry & Machine Co., Warren; M. C. Boyd, secretary and treasurer of the Heltzel Steel Form & Iron Co., Warren; J. H. Fitch, Jr., treasurer, the Newton Steel Co., Newton Falls; J. M. Faris, superintendent mechanical and electrical department of the Youngstown Sheet & Tube Co.; E. T. McCleary, assistant general superintendent the Youngstown Sheet & Tube Co; V. E. Rehr, vice-president of the Aetna Foundry & Machine Co., Warren; G. H. White, general manager the Trumbull Steel Co., Warren.

The present officers were re-elected to serve as follows: M. I. Arms, II, president and treasurer; M. C. Boyd, secretary; V. E. Rehr, vice-president and general manager.

Reports submitted covering business done last year show a very steady growth and it will probably be necessary to work two shifts in order to take care of present business.

At the annual meeting of the stockholders of the Keystone Driller Co., Beaver Falls, Pa., held recently, a fund of $50,000 was set aside to purchase fixtures and stock for a co-operative store. The plan is to sell food supplies to all employees of this company at actual cost.

The business of Warren Brothers, dealers in contractors', road builders' and builders' machinery and equipment, Louisville, Ky., has been bought by the R. B. Tyler Co., 110 South Fourth Street.

FRENCH ELECTROLYTIC IRON

Competes With Best Swedish Iron—Its Use as Tubes

Considerable interest is being paid abroad to iron produced electrolytically, and the recent developments are summed up by Jean Escard in several recent issues of *Le Genie Civil*.

The first patents relating to real industrial production on a large scale were taken out in 1910 by the Le Fer Co. of Grenoble. In principle the method used depends on a rotating cathode and a neutral solution of iron salts maintained neutral by circulation of the liquid over iron turnings. The bath receives regularly additions of a depolarizer (oxide of iron), the aim of which is to eliminate as much as possible the liberation of hydrogen at the cathode, which is harmful to the iron deposit when present in too large quantities.

Current Density

By these methods it is possible to work with large current density, even up to 1000 amperes per sq. m., and, as shown later, the metal obtained is of excellent quality. It competes favorably with the Swedish irons renowned for their purity. By this method two companies, the Fonderies et Forges de Sainte Marie et Gravigny and the Etablissements Bouchayer et Viallet, make plates and tubes in many shapes and weights.

Practical results have shown that for industrial work it is necessary to use strong current densities. The electrolyte is generally chloride or sulphate of iron or a mixture of salts of iron. In using an electrolyte without previous treatment the metallic deposit is very irregular and without commercial value. In order to obtain a smooth, compact, homogeneous deposit capable of being used after simple annealing, the electrolyte must be agitated for instance by the simple rotation of the anode, in such a way as to bring about an oxidizing action of the air at the same time as the real electrolysis. The iron salts, being easily oxidized, a modification is brought about in the bath. Notably oxy-chloride of iron is formed which reacts with the globules of hydrogen deposited on the cathode that cause bad deposits. The bath is satisfactory when it is not green but chestnut and does not foam.

Conditions of Manufacture

In order to have good results, the following conditions must be followed:

Rotate the cathode at a tangential speed which varies with the current density.

Regulate the temperature according to a given current density and maintain this temperature absolutely constant.

Regulate the concentration according to the depolarizing power of the liquid and maintain this concentration absolutely constant.

Maintain a speed of circulation as large as possible of the electrolyte in front of the anode. It has been found that the phosphorus in the metal is decreased as the circulation of the bath increases.

If the neutrality of the bath is not maintained the deposit of metal cannot be commercially used, due to exfoliation. This neutrality can be realized by holding finely divided iron in suspension in the liquid or by bringing the electrolyte in intimate and constant contact with turnings.

Analysis and Practical Use

In regard to practical use of electrolytic iron, particularly for autogenous welding of iron, steel and cast iron, the raw metal becomes ductile by heating. This heating may be followed by rolling, which gives a product absolutely perfect for welding. During heating the metal must be protected from all contact with gas that may introduce carbon or other impurities. Below is the analysis of metal obtained as thin plates:

	Per Cent		Per Cent
Iron	99.967	Phosphorus	0.002
Carbon	0.008	Sulphur	Trace
Manganese	0.009	Silicon	0.014

After annealing it is finely crystalline and as malleable as pure copper. Below are given analyses of two samples, one of cast iron, the other of electrolytic iron made from it.

	Cast Iron Used, Per Cent	Electrolytic Iron Obtained, Per Cent
Carbon	2.35	0.004
Phosphorus	1.07	0.008
Sulphur	1.07	0.006
Silicon	1.31	0.007

This shows the great purity of metal that may be obtained. In regard to phosphorus it is possible to guarantee less than 0.01 per cent.

The physical properties vary according to the treatment used. Tubes annealed for two hours at 900 deg. C. in magnesia show: Tensile strength, 43,950 to 46,650 lb. per sq. in., and elongation of 40.3 to 43.1 per cent in the longitudinal direction. These same tubes after annealing can be deformed and upset without cracking. The Brinell hardness number is only about 90. The melting point is 1485 to 1525 deg. C. and the solidification point 1485 to 1505 deg. C., according to A. Muller, who has done much work on this point.

Its Use as Tubes

In regard to industrial use the manufacture of tubes is now regular practice. Bouchayer et Viallet at Grenoble make these tubes up to 4 and 5 meters long, 10 to 20 cm. diameter (3.94 to 7.87 in.) and 1 to 6 mm. thick (0.039 to 0.236 in.).

The deposit is made on a metallic mandrel, the whole is annealed and the tube taken from the mandrel. These tubes present several advantages. The thickness of wall is regular whatever the diameter, thickness or length of tube. The use of these tubes has given every satisfaction and they enter into direct competition with seamless tubes heretofore imported into France from Germany. Regular plate can also be made without rolling, and such plates are particularly valuable where their magnetic and low hysteresis properties can be utilized; for instance, in direct and alternating current motors, transformers and dynamos. Also electrolytic iron can successfully compete with the best Swedish irons for several reasons. It can be produced with regularity and when freshly made it is brittle and can be readily broken up for remelting. Its use as raw material for the manufacture of tool steels and special steels has given every satisfaction.

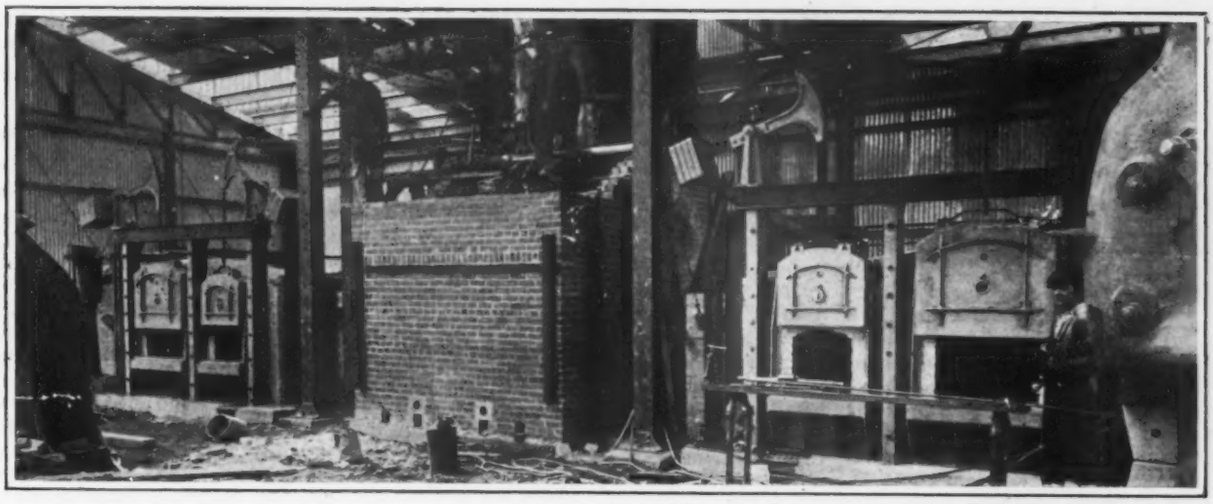
G. B. W.

Acid Steel by a Quadruplex Process

A quadruplex process for making acid steel of purity comparable to that of Swedish or crucible steel is suggested by a patent (U. S. 1,309,496) granted to William R. Walker, assistant to the president, United States Steel Corporation, 71 Broadway, New York. After Bessemerizing in an acid converter to remove nearly all the silicon in the pig, the metal is transferred to a basic open-hearth when the carbon has been reduced to about 0.5 per cent. In this way the phosphorus is removed under the ordinary basic slag of lime and iron oxide. The next step is done in a basic electric furnace, and nearly all the sulphur and remaining phosphorus can be removed under a slag mostly of lime containing from 10 to 35 per cent of silica depending inversely upon the amount of sulphur to be removed. Finally the molten metal is transferred to an acid electric furnace, and worked under a siliceous slag, containing just enough lime for fluidity yet not enough to attack the furnace lining (perhaps 75 per cent SiO_2, 25 per cent CaO or basic equivalents). This dead melts the metal, adding silicon reduced from the slag, which in turn replaces metal in any oxide existing in the bath. When the whole has been sufficiently deoxidized and siliconized, it is tapped and cast.

The Black Steel & Wire Co., Kansas City, Mo., is constructing an open-hearth furnace and a rolling mill, which are expected to be completed by April 15.

The Penn-Seaboard Steel Corporation and the Admiral Anchor Co. have removed their New York offices from 111 Broadway to 2 Rector Street.



SEMI-PRODUCER FURNACE

Long Life for Refractories—Waste Heat Utilized in Water Tube Boiler

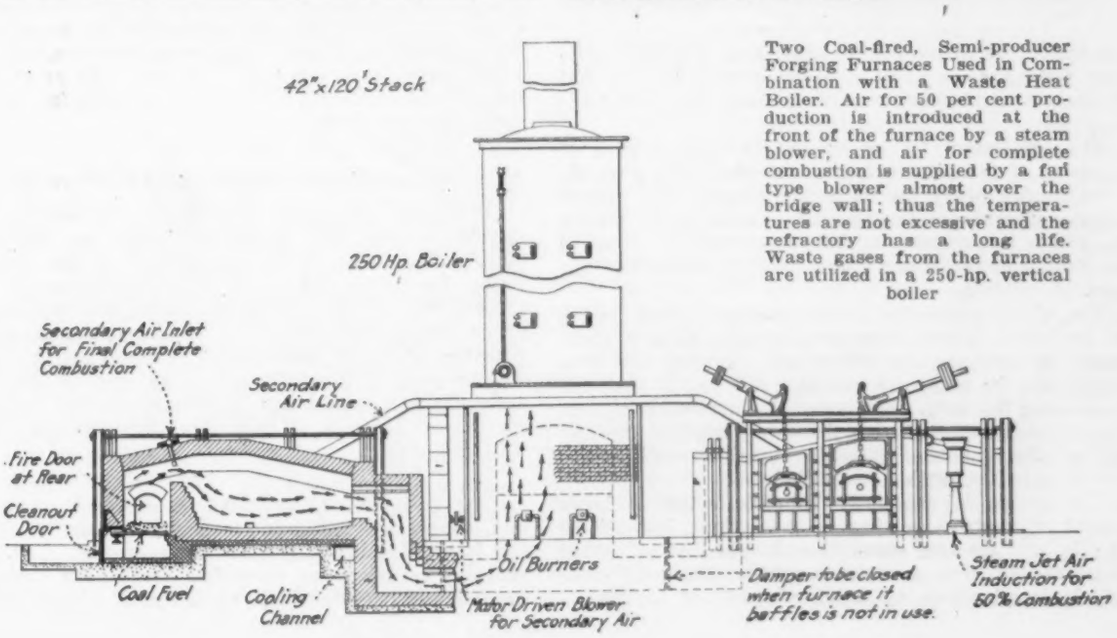
The accompanying illustrations show an installation of semi-producer forging furnaces which are used in combination with waste heat boiler at the plant of the Burke Steel Co., Rochester N. Y. It consists essentially of two forging furnaces, the chambers of which are 8 ft. 8 in. long by 5 ft. 9 in. wide, with a height varying from 2 ft. 6 in. to 3 ft. at the front of the skew. These furnaces are coal fired and operate under the following conditions:

The grate in each case is at the end of the furnace farthest away from the boiler, and the cleaning doors are placed at the end and are air tight. Air for approximately 50 per cent complete combustion is introduced under the grate by a Schutte & Koerting steam blower, which is mounted in an accessible place at the front of the furnace. By means of this air and steam the coal is converted into the gases of incomplete combustion (carbon monoxide) and passed over a bridge wall separating the grate from the furnace heating chamber. At a point almost over the bridge wall, air from a conventional blower of the fan type enters through ports in the arch in sufficient quantities to burn the gases passing over to carbon dioxide or complete combustion. Up to this point, therefore, the operation is essentially that of a gas producer. The advantages derived from this system lie in the fact that as only about one-half of the heat is liberated within the combustion chamber, the temperatures are not excessive, and therefore the refractory has a long life.

The air from the blower entering through the arch meets the gases where it is desired to liberate the greatest amount of heat at the most effective point. The air entering downward through the arch diverts gases from the arch downward and this tends to protect the arch from excessive heat and also to flow the heat downward against the work being heated, and by this arrangement greater economy in heating is secured. Each furnace has two doors on the front, the larger door being 2 ft. 6 in. wide, 2 ft. high, the smaller door being 20 in. wide and 17½ in. high.

Mounted midway between the two furnaces, and slightly to the rear, is a Wickes boiler of the vertical water tube type; the waste gases from the furnace are carried downward through flues to the combustion chamber of the boiler and then circulated through the boiler by passing upward around the tubes and again downward, leaving the boiler at the bottom, where they pass into a 42-in. diameter by 120-ft. stack. In case the gases leaving the furnace are not sufficient to heat the boiler, two burners are placed in the combustion chamber of the boiler so that they can be used as auxiliary to the gases from the furnace. It would appear, however, from the tests that have been made that it would be unnecessary to use these burners, ample heat for all purposes apparently being received from the furnaces as waste.

The boiler is used to operate two Chambersburg hammers, for which the furnaces are to heat the billets. One of these hammers is a 3500-lb. size, the second one is 2000-lb. size. The installation was made by Tate-Jones & Co., Inc., Pittsburgh.



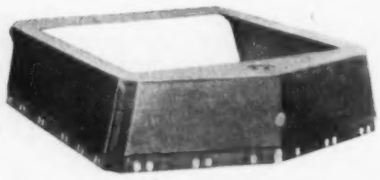
Two Coal-fired, Semi-producer Forging Furnaces Used in Combination with a Waste Heat Boiler. Air for 50 per cent production is introduced at the front of the furnace by a steam blower, and air for complete combustion is supplied by a fan type blower almost over the bridge wall; thus the temperatures are not excessive and the refractory has a long life. Waste gases from the furnaces are utilized in a 250-hp. vertical boiler

Automatic Arc Welder

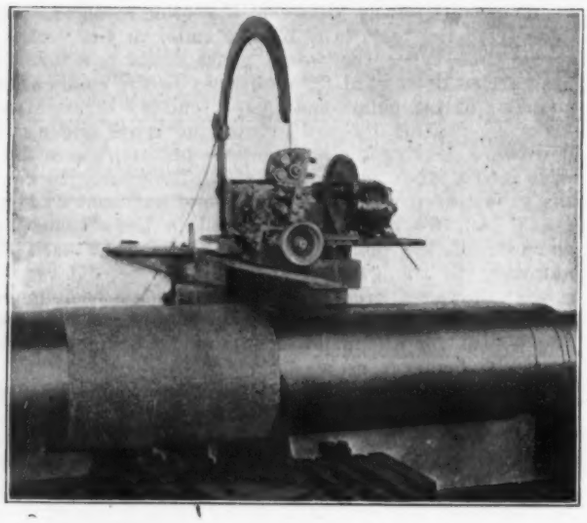
Automatic arc welding is now accomplished by a new device perfected by the General Electric Co., Schenectady, and soon to be put on the market. It is known as the automatic arc welder, and is for use with the regular welding set, taking the place of the band-controlled electrode. It consists of a pair of rollers, called feed rolls, driven by a small direct current motor, which draw in and deliver a steady supply of wire to the arc, and automatically maintain the best working distance. The whole is controlled from a small panel.

The welding head is held by a suitable support with a certain amount of hand regulated adjustment, and consists of a steel body carrying feed rolls and straightening rolls which are both adjustable for various sizes of wire. The arm is supported on a gear box, together with the motor. This box contains gears which give three gear ratios, thus extending the range of the device while allowing the motor to operate at its most favorable speed.

The control panel carries an ammeter and voltmeter for the welding circuit, as well as rheostats, a control relay, and the contactors and switches for the feed motor. It is possible to start and stop the equipment from the work by a pendant push button, but adjustment of the feed conditions must be made from the panel.



An Automatic Welding Machine Perfected by the General Electric Co. Is Shown Below Rebuilding a Worn Shaft. It is also adaptable to welding seams of tanks and plates



The adjustment for arc conditions by regulation of the speed of the feed motor, as the arc voltage varies, is taken care of by the panel equipment. The manufacturer states that the result is a practically steady arc, which is superior in smoothness of operation to the hand-controlled arc, consequently increasing the speed of welding.

The whole apparatus is mounted on a base which can be bolted to any form of support. Thus a great variety of working conditions can be met, but provision must be made for carrying the arc at uniform speed along the weld. For instance, for straight seams, a lathe or planer bed may be used, and for circular ones a lathe or boring mill. However, the local conditions dictate the method to be followed.

The device is especially valuable where a large amount of routine welding is to be done, since it is capable of a greater speed than is possible to skilled operators and gives a uniform weld of improved quality. It is adaptable to welding seams of tanks and plates, rebuilding worn or inaccurately turned shafts, rebuilding worn treads and flanges of wheels, and many other kinds of work.

Advocates Proposed Department of Public Works

Prof. George F. Swain, school of engineering, Harvard University, gave an interesting discourse on the proposed National Department of Public Works as provided for in the Jones-Reavis bill, Senate No. 2232 and House No. 6649, to members of the Boston Society of Civil Engineers and the Boston sections of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers in a joint meeting at the Harvard Union, Cambridge, Mass., on the evening of Feb. 24.

Professor Swain is chairman of the Massachusetts committee formed for the purpose of bringing about the enactment of the bill, was successful in forming committees in other New England States, is one of the prime movers for the bill, and therefore familiar with all details connected with it. To those present he read the bill and explained in detail the meaning of its various passages, following which he expressed his personal opinions of the merits of the bill, which were as follows:

It will conduce to efficiency by co-ordinating in one department and under one head the administration of all works built and operated for the use of the public.

It will conduce to economy. There will be either less expenditure or greater result obtained for each dollar expended.

It will eliminate rivalry and competition for appropriations between different departments.

It will provide a complete organization which can, if necessity requires, be turned to war work or any other emergency.

It will provide an organization equipped to do technical work for other departments at their request.

It will result in a standardization of specifications and contracts.

It will, therefore, eliminate much of the risk and delay which a contractor now has to face in taking a government contract.

It will simplify the purchase of materials, machinery, etc., and conduce to economy in such purchases.

It will help to bring about the establishment of a budget system.

It will serve as a regulator of our national industries, because the department can speed up its work in dull times and slow down in boom times.

Most other civilized countries have a Department of Public Works, under a cabinet minister.

It will provide means for giving to the officers of the Corps of Engineers of the United States Army a broader experience in construction work than they now have and covering lines more specially connected with the work which they have to do in war.

It will help to prove to the world that a democracy can be administered economically and efficiently.

Professor Swain stated that the only objections to the bill so far encountered came from people who believed it provided for an additional cabinet officer and from interests opposed to the placing of the Department of Education under the jurisdiction of the Department of Labor, as provided in the bill. He went on record that the sponsors of the measure would not insist on the placing of the Department of Education as recorded in the bill, saying it could be placed under the jurisdiction of any department other than the proposed Department of Public Works. He pointed out that the Jones-Reavis bill does not provide for an additional cabinet officer.

International Display and Salesroom

Plans are now under way for an international commercial display and salesroom, known as the Paris-Marche-du-Monde, to be constructed on the Quai de Passy, Paris, France, at an approximate cost of over 150,000,000 fr. It will be six stories and will cover a ground space of 48,000 sq. m., or about 13 acres, with a frontage of 850 ft. and a depth of about 600 ft. There will be over 5000 exhibit spaces or units of 15 sq. m. each. Milton L. Schmitt is director of the American division of exhibits. Temporary offices are at 18, rue Taitbout, Paris.

The C. L. Hils Co., Cincinnati, dealer in scrap iron and other materials, has recently purchased a Browning locomotive crane for use in its yards. The great shortage of labor for unloading scrap iron made this necessary. The crane will be equipped with a magnet.

COAL DUST EXPLOSIONS

Investigations of Hazards from Partially Consumed Fuel—Preventive Precautions

BY L. D. TRACY*

The increased demand in the Pittsburgh district for natural gas for domestic use and the increasing difficulty in securing an adequate amount of natural gas, has led a number of the steel companies to substitute pulverized coal as a fuel for the furnaces. Elaborate installations have been made for pulverizing the coal and conveying it to the furnaces. Soon after the furnaces commenced to operate with pulverized coal, large quantities of fine dust began to accumulate on the platforms over the furnaces, the roof trusses, on the outside of the various pipe lines, electric cables and even on the roofs of the buildings.

Some of the companies, becoming alarmed, requested the Bureau of Mines to make an investigation to ascertain the liability of this dust to cause an explosion. While conducting this investigation an explosion occurred in another mill which caused the death of one man and severely burned two others.

Analyses of Accumulated Dust

Eleven samples of the dust, which for convenience has been termed mill dust, from various locations in the different mill buildings were taken and submitted to chemical analyses, microscopic examinations and also to flame and explosion tests. From the chemical analyses it was found that the volatile matter in the dusts ranged from 6.3 per cent to 23.54 per cent, fixed carbon from 50.88 per cent to 67.08 per cent, and the ash from 22.29 per cent to 32.16 per cent.

Five samples of the pure coal dust, before passing into the furnaces, were subjected to a chemical analysis, and it was found that the volatile matter in the coal ranged from 30.50 per cent to 36.81 per cent, the fixed carbon from 46.86 per cent to 52.48 per cent, and the ash from 9.26 per cent to 21.84 per cent.

Under the microscope a sample of mill dust, which by chemical analysis showed 23.5 per cent volatile matter, was found to contain a very large proportion of very fine partially coked coal dust, a small proportion of fine or medium fine partially coked coal dust and some dust thoroughly coked. In addition, a considerable portion of yellow resinous appearing matter, some particles of carbon which might be termed soot and some small particles of ash were found.

A sample, which by chemical analysis was found to contain but 11.25 per cent of volatile matter, under the microscope showed only a relatively small proportion of medium sized partially coked coal dust and many thoroughly coked particles.

From these examinations and analyses it would seem that, for some reason, the pulverized coal was being blown out of the combustion chambers of the furnaces before it had been thoroughly consumed.

Explosion Pressures

The several samples of dust were also subjected to tests to determine the pressure which might be exerted by the dust in a possible explosion, as compared with pure pulverized coal; this test was conducted in the Clement-Frazer apparatus (described in Technical Paper 141 of the Bureau of Mines). The average pressure obtained was 14.5 lb. per sq. in.

A sample of the dust, containing 23.54 per cent volatile matter, exploded in the apparatus with a recorded pressure of 10.21 lb. per sq. in., a second sample containing 20.6 per cent volatile matter recorded a pressure of 8.7 lb. per sq. in., and a third sample with 15.91 per cent volatile matter recorded a pressure of 4.6 lb. per sq. in.

It will be noted that the sample containing 23.54 per cent of volatile matter registered a pressure but little under that of pure coal dust. When the small quantity of dust which was exploded is taken into consideration and a pressure of over 10 lb. per sq. in. is obtained, it will be readily seen that, with a large amount of dust exploding, the pressure would run much higher, if confined.

Further experiments to determine the explosibility of the mill dust were carried on in the dust explosion gallery of the bureau. This is essentially a horizontal wooden box, 6 in. deep by 6 in. wide and 14 ft. long, made of 2-in. planks, held together by wooden clamps and iron rods, in such a manner that the top may be removed. A metal flap valve covers the back end of the gallery, the other end being left open. At uniform distances along the entire length of the floor of the gallery are 14 holes, into which are fitted ¾-in. pipe jets projecting vertically from a 2-in. horizontal pipe extending beneath the floor of the gallery. The back end of this pipe is closed by a cannon having a capacity of about one-fifth of an ounce of powder, the other end being left open. A loose metal disk covers the end of each jet leading into each hole in the floor of the gallery, thus forming a pocket for the dust, about one-tenth of an ounce, with which each hole was loaded.

Each hole is covered by a small square of coarse, heavy screen held in place by large washers bolted to the floor of the gallery. The purpose of this screen is to diffuse the dust into a cloud of more uniform density. The gallery was loaded by pouring about one-eighth of an ounce of the mill dust in each of the 14 holes in the floor of the gallery. The squares of screen were then placed in position over each hole.

The cannon in the end of the horizontal pipe beneath the gallery was loaded with about one-sixth of an ounce of powder, and about a third of an ounce of loose powder was placed between the first two holes in the floor of the gallery. After the loading of the gallery had been completed, the top was bolted on and the electric firing wires connected. The explosion of the powder in the cannon served to raise a dust cloud and the loose powder was used to start the initial explosion of the dust cloud. The cannon and loose powder were fired by means of electric spitters, the cannon being fired two seconds before the loose powder.

From experiments made in the Fraser apparatus it was believed that the division point between explosibility and non-explosibility would be found in dust containing between 10 and 15 per cent volatile matter.

Two samples, one containing 13.45 per cent and one containing 10.99 per cent volatile matter, were tested in the gallery. The first sample was found to be quite explosive, while the one containing 10.99 per cent is less explosive and would probably require an initial explosion to ignite it.

Inflammability Tests

Tests were also made to determine the inflammability of the dust, the methods of testing closely duplicating conditions in and around a steel mill, where the red hot iron and steel are often in close proximity to clouds of dust. Two samples containing 20.60 per cent and 23.54 per cent of volatile matter burned readily and with more or less explosive violence. Three samples containing 11.5 per cent, 13.45 per cent and 15.91 per cent of volatile matter burned readily, but without the violence of the two preceding samples. Two samples containing 11.25 per cent and 10.99 per cent of volatile matter were found slightly inflammable and one only 7.17 per cent volatile would not burn at all.

From the above described tests and from similar tests with dust from the steel mills of other companies it has been fairly well demonstrated that the division point between mill dust which will explode and that which will not explode is reached when the dust contains about 11 per cent of volatile matter.

A good example of the great danger from mill dust, caused by the use of pulverized coal, is the fire which occurred a few years ago in a plant in which there were a number of puddling furnaces, some of which used pulverized coal as a fuel. A draft of air blew some of the coal dust over some red hot iron or slag. The dust immediately ignited and communicated the flames to the roof trusses. These were covered with fine dust, which caused the roof to burn so quickly that the men barely escaped in safety from the building.

Many of the systems distributing coal dust to the

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furnaces consist fundamentally of fans which drive the dust from the storage bins through large pipes, from which small feed lines lead to the burners. It is the practice in some mills, when the furnaces are shut down, to stop the fan before all the pulverized coal in the pipe line has been thoroughly blown out. This is a rather dangerous practice, for the reason that, when the pressure from the fan is stopped, there is liable to be a back draft from the furnace which may take live sparks into the feed line. These sparks will smoulder until the fan is started again and then will be fanned into a flame, igniting the dust in the feed line, with a consequent explosion.

The roof trusses, pipes, platforms and all other places upon which any considerable amount of dust might accumulate should be kept thoroughly cleaned. In cleaning these trusses, platforms and so on no flame torches or open lights should be used because of the danger of igniting any dust cloud which might be raised in the operation.

All electric switches and motors should be kept from dust, and all electric wiring should be kept away from any place where dust in large quantities is liable to accumulate. As far as possible the wiring should be carried in conduits.

Provision should be made to protect properly all pulverizing machinery from damage which might be caused by an explosion due to the ignition of coal dust from static electricity in the machinery. All conduits, grinders and other parts in which an electric spark is liable to be produced should be grounded. Care should be taken that there is no way in which the coal dust can come in contact with hot metal.

In some of the furnaces in which natural gas has been used it is customary to keep both the gas and pulverized coal connections ready for service. If coal is being used the gas connection should be cut out, as there is a chance that a leaky valve may allow gas to accumulate in the main coal feed and become ignited by a back fire from the furnace.

As the problem of mill dust and the consequent danger therefrom seems to be prevalent in some plants using pulverized coal it would seem imperative that every mill official should take precautions to prevent loss of life and property by an explosion or fire from this dust.

Film Teaches Uses and Abuses of Drills

Designed for Showing in Shops Because Printed Instructions Are Often Not Read

BY F. L. PRENTISS

THE value of the educational moving picture film in industry has been recognized for some time by progressive manufacturers and a number of very interesting films of an instructive character have been produced, the object generally being to illustrate the manufacturing process before spectators engaged in other fields of activity, who have more or less vague ideas of the methods employed in making the products in that particular field. Another type of film for which there is apparently a wide and as yet little developed field, is one designed to educate the workman in the plant so that he will know how to handle machines and tools properly, do better work, increase production and reduce waste.

A film of this type, which is undoubtedly one of the best that has been produced for teaching workmen proper machine shop practice, was recently made by the Cleveland Twist Drill Co., Cleveland. This film, in four reels, requiring 40 minutes to present, illustrates the uses and abuses of twist drills. In reality it is a reproduction in picture form of a booklet on this subject issued by this company and it is intended primarily to reach the inexperienced and incompetent workmen. The company felt that while a conscientious and competent operator of a drilling machine read the booklet, the indifferent workman could seldom be reached in that way but could be educated by means of the film.

To Teach More Output and Less Breakage

The purpose of the film is to depict the best uses and the most common abuses of the twist drill so that as a result of the workman's better understanding of the drill there will be more production and less breakage. Among the subjects illustrated in the film, with proper captions to make the various terms used in connection with drills perfectly clear to the spectator, are body clearance, web increase, lip clearance, etc. The worker is taught to grind a drill properly and examples and results of faulty grinding are shown, the pictures explaining in what respect the drill has been ground, either correctly or incorrectly. The various abuses to which workmen subject twist drills and the effects of these abuses are also illustrated. Advertising features are avoided, the only reference to the company or its product being a picture of the plant.

The film has been exhibited in a large number of manufacturing plants during the past few weeks, and that it has been very favorably received is indicated by letters of appreciation from manufacturers. One production engineer of a large concern writes:

Film Combats Foolish Excuses for Failures

"My purpose of having the motion picture production exhibited in the plant was to combat the silly excuses offered by both the foremen and workmen for the failure of efficiency in drilling operations causing: (1) Low production figures; (2) excessive drill breakage; (3) excessive drill grinding. In most cases the excuse for inefficiency centered around the material to be drilled and in no case was any attempt made to examine the drill for proper or improper grinding or the cutting edges, or the point of the drill to determine the proper relation of feeds and speeds. Your film helped to drive home to everybody the soundness of my strenuous campaign for several weeks for correct drill grinding as a preliminary for getting results in drilling; this I consider of prime importance."

The Cleveland Twist Drill Co. will furnish the film free of charge to manufacturers and dealers. With it is supplied a portable picture projecting machine operating from any lamp socket and it may be shown in any room that can be slightly darkened.

Reading's Plan

A plan of employees' representation has been adopted by the Reading Iron Co., Reading, Pa., which operates a total of a dozen plants in Danville, Pa., Birdsboro, Pa., and Reading. This plan was adopted, according to President Leon Thomas, at a meeting of 45 representatives from its plants, subject to the approval of the workmen.

Each plant, according to tentative plans, will establish a local council, members to be elected by secret ballot. Each council will elect a delegate to a central council to meet in Reading at regular intervals and to confer with company officials on wages, hours, shop conditions and grievances.

An electric flood light for industrial purposes is being manufactured by the Alexander Milburn Co., Baltimore. It is mounted on a tripod and can be lowered to the ground level or raised to a height of 6 ft. It is constructed to focus at any angle or position, revolving in a complete circle.

New Type of Danger Signal

An industrial danger signal, a feature of which is an indicator which points either up or down to indicate the possible source of danger, has been designed by Kenneth P. Babcock, safety engineer Gilbert & Barker Mfg. Co., Springfield, Mass., and used for five months in the plant of that company. According to Mr. Babcock it "has proved by far the most successful in our plant." Applying psychology to their use, the signs are kept from the employees' vision as much as possible when not in use in order that they may not lose their force when on duty. "Familiarity breeds contempt," as its designer suggests.

Employees' Traffic-way Protector Guard for General Factory Use. The standard is 1¼-in. pipe screwed into the base. The sign is No. 12 gage sheet metal, 16 in. x 22 in. At the top is the standard safety danger design, 5 in. square. The lettering and indicator are black; the indicator circle, white; the background, light green. The pipe is split, bent hot and flattened to the sheet metal of the sign. The total height is 5 ft.; the diameter of the base, 15 in.

Said Mr. Babcock: "All concerns in different degrees are confronted with injury hazard from the activities of millwrights, pipers, electricians, carpenters, stock handlers, contractors and others working at various heights above, as well as below, entrances, busy passageways and the general factory floor space, particularly in newly finished buildings. While our plant would not rank as a particularly hazardous concern in this respect, a degree of danger from this source exists continually.

"The success or failure of any danger warning device depends largely on the degree of education and calibre of the human element surrounding it. Two signs are sufficient to meet our requirements adequately. Frequently both signs are in service, but seldom at such a time is a third called for. All department heads and their foremen have been asked to maintain a ruling that a sign must be used whenever a gang or part of a gang attempt any work overhead or beneath the floor surface. When a sign has served its purpose it is returned promptly to the safety engineer's office where it is covered until again desired for use."

When asked why the indicator could not be made to warn of dangers at the right and left, as well as above and below, Mr. Babcock replied: "It could, if desired, but I believe in so doing the force of the sign warning would be reduced, as it is designed to point out obscured dangers, so to speak—those which do not come in a normal vision range as dangers to the right and left do; these are seen without warning as a rule. It is always best not to attempt crowding such indicators. In so doing they become practically useless. If anyone finds that a sign pointing to the right and left would be of great value, it would be best to build two signs, having one point to above and below, and the other to the right and left.

"I see no reason why this sign could not be applied to the iron and steel industries with as much success as in any other industry; in fact, in many respects I believe better, as there are as many hazards, particularly from above and below in such plants."

Self-Propelled Radial Loader

A radial loader which is self-propelling and designed for the handling of sand, gravel, crushed stone, ashes, slag, etc., is a recent product of the Jeffrey Mfg. Co., Columbus, Ohio. The three-wheel construction is explained as enabling the loader to move backward and forward along straight lines into a pile of material or to cut wide swaths across the face of a pile by swinging alternately upon its driving wheels as pivots. This action is obtained through the use in its driving unit of a set of differential gears whereby the driving wheels act in conjunction with or independently of each other.

By turning the steering wheel at quite an acute angle to the driving wheels, the discharge chute will remain practically stationary at the center of the circle while the pick-up end of the extending elevator boom will travel in a circular path or by alternately reversing the propelling drive, the loader will oscillate back and forth in an arc. If the steering wheel is gradually turned through a few degrees either way from the above circular path, the whole machine, while cutting from right to left in an arc, will gradually move forward into the pile, allowing full range of the machine. The small radius in which the loader will operate is emphasized as a feature. The iron buckets are 14 in. x 10 in. and are protected from wear by renewable digger edge steel teeth riveted on front lips and ends.

The loader has a fast speed of 60 ft. per min. for traveling from pile to pile and a slow speed of 4 ft. per min. for feeding into the material. The rated capacity of the machine is 1 cu. yd. per min. It will load crushed stone, maximum size pieces through 2½-in. ring, and maximum size coal 6-in. lumps. The loader is equipped with either electric motor or gasoline engine.

Differential Gears in the Driving Unit Enable This Three-wheel Self-propelled Radial Loader to Cut Wide Swaths Across the Face of a Pile of Material by Swinging Alternately Upon Its Driving Wheels as Pivots

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The Arthur C. Harvey Co., South Boston, iron and steel, is moving into its new warehouse at Allston. The company's office will not be moved for some time, as the Allston plant is not finished. The company has about 40 cars of iron and steel ready to unload at Allston as soon as weather conditions permit, and considerable stock already in the new plant.

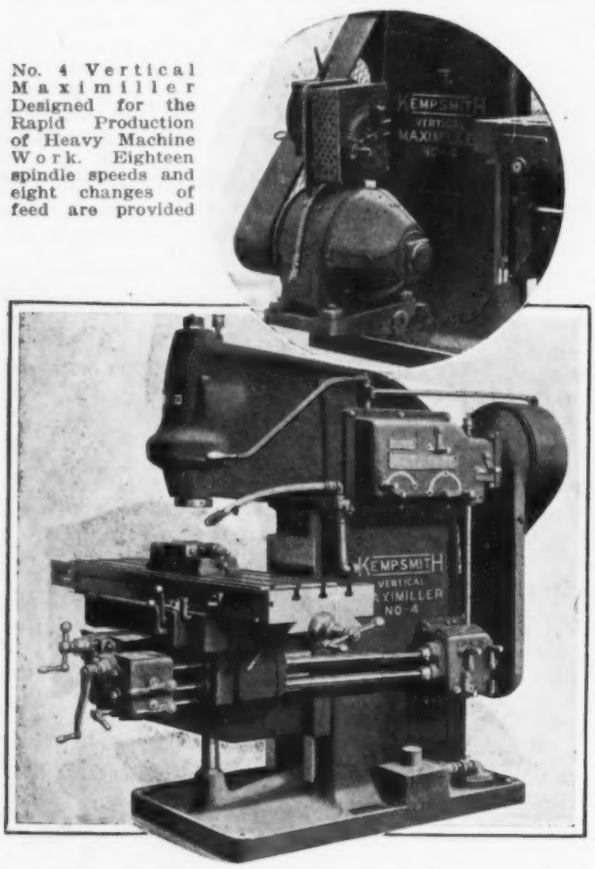
The Illinois Steel Co. has purchased 34 acres adjoining its present holdings of 160 acres in Thornton, Chicago, fronting on the Belt Railroad of Chicago.

Vertical Milling Machine

A vertical milling machine designed for the rapid production of heavy machine work and known as the No. 4 vertical maximiller, has been placed on the market by the Kempsmith Mfg. Co., Milwaukee. This machine embodies several features of the company's No. 4 plain horizontal maximiller, which was placed on the market about 16 months ago.

The design of the knee is the same as that used on the company's horizontal machine, having no openings in the top and but three small openings in the side walls. This solid construction is emphasized as serving to resist clamping strains and the tortional effect of the table overhang. The cross feed screw is located in a shallow depression in the top of the knee at the exact center, thus to insure the greatest possible strength and accuracy, as the pull is applied directly to the center of the saddle.

The column is explained as having few and small openings, as being ribbed, with a rib midway of the column height forming a reservoir for the speed drive



No. 4 Vertical Maximiller Designed for the Rapid Production of Heavy Machine Work. Eighteen spindle speeds and eight changes of feed are provided

oil. The knee, table and saddle are counterweighted inside the column, thus to provide easy, vertical adjustment of work in relation to the cutter, and making it unnecessary to have an auxiliary vertical slide for the spindle. The table has a working surface of 79 in. by 18 in. and a longitudinal range of 42 in. The table gib is of the adjustable taper type with locked adjustment.

The spindle nose is of patented type and provides for driving face milling cutters in either direction, and permits the cutter to be readily removed. The slow speed shafts in the spindle train are alloy steel. The bevel gears are of the spiral bevel type. The manufacturer states that extreme rigidity and driving power can be obtained, since the usual auxiliary slide for raising and lowering the spindle has been eliminated.

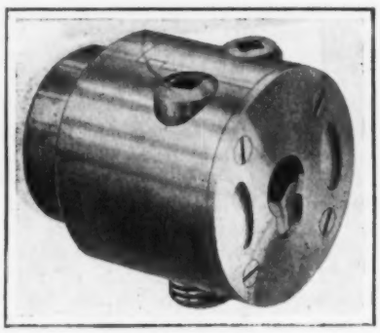
The right-hand design has been used and a spindle reverse has been incorporated. To reverse the spindle one small lever is thrown a distance of about 3 in. A hand lever in the front of the machine operates the clutch, which is of the friction plate type. The momentum of the spindle is overcome by a brake operating on the reverse throw of the clutch lever. The drive pulley is mounted on ball bearings and with the clutch is enclosed in a protective housing.

The machine is arranged with power quick traverse giving 100 in. per min. travel of the table in either direction and 36 in. per min. on the vertical movement and the traverse movement. Safety devices to protect the mechanism are incorporated in case the operator engages the wrong lever. Two levers control the longitudinal feed and quick traverse, the operator pushing the one required in the direction he wishes the table to travel. The knee and saddle are controlled by a second set of two levers. Eighteen spindle speeds are provided giving a range of from 14 to 355. Eight changes of feed range from 5/8 in. to 25 in. per min. in geometrical progression. Safety devices are incorporated to slip before a destructive load comes on the feed drive, which takes up its driving function again without attention as soon as the load drops to safe limits. The change in the power quick traverse rate does not affect the speed rate of the cross and vertical movements, these remaining the same for all movements. The quick traverse is available even if the spindle and feed are not operating, which is emphasized as a particular advantage in setting up the machine or in returning the table after completing a cut. The drive may be interrupted at the drive pulley in case the machine is not in use.

A pump with about 15 gal. capacity per min. is built in the machine. The gears and bearings in the entire speed mechanism run in oil and are lubricated by splash. The balance of the oiling system is centralized at two points, thus to make it certain that none will be overlooked. The machine is regularly arranged for single pulley drive, but can be furnished arranged for motor drive through belt.

Drill Chuck Boring Head with Offset

A twin screw drill chuck made by the Marvin & Casler Co., Canastota, N. Y., was described in THE IRON AGE issue of April 10, page 959. This chuck was equipped with two screws for gripping the work. A new drill chuck boring head similar in appearance and also equipped with two screws, but in this case employing one screw for gripping the drill or boring tool and the other controlling the offset is announced. Drills, reamers or counterbores with shanks up to 3/4 in. in diameter are chucked with the grip screw, which is graduated to thousandths of an inch.



An Offset of 3/8-in. Is Provided by This Drill Chuck Boring Head for Round or Hexagonal Boring Tools Up to 9/16-in. in Diameter

An offset of 3/8 in. can be obtained with either round or hexagon boring tools up to 9/16 in. in diameter, while an offset of 1/2 in. is obtained with round or hexagon boring tools up to 1/4 in. in diameter. The boring head can be equipped with taper shank and mounted on the milling machine for drilling, reaming and boring holes accurately to size in jig, fixture and gage work. It is emphasized as especially good for undercutting and recessing when mounted in the turret lathe. The body is 3 in. in diameter and 3 3/8 in. long.

Blast Furnaces is the subject of No. Me 2 of Safe Practices issued by the National Safety Council, 168 North Michigan Avenue, Chicago. The pamphlet covers the fundamental safety requirements of blast furnaces, cast houses, stoves, gas cleaning apparatus, skip hoists, pig casting machines, stock houses and stock handling machinery.

J. R. Dawson, formerly with the American Steel & Wire Co., Worcester, Mass., has been made instructor, department of metallurgy, Lehigh University, Bethlehem, Pa.

German Iron and Steel Prices Much Higher

Ore Situation Serious—Government and Steel Producers in a Deadlock—Consumers Insist on More Representation—Outlook Not Good

(*Special Correspondence*)

BERLIN, Feb. 7.—A further stormy upward movement of prices in the iron trade has occurred since my last report. In the main it was divided into two separate advances. On Jan. 24 increases were adopted ranging between 675 marks for semi-finished material to 1200 marks for nickel and thin sheets. These prices took effect on Feb. 1, although the Economic Minister had refused to give his sanction to them. The association, however, not only voted to put them into force, but even to add a further 150 marks to compensate them for another big advance in coal and coke prices. The new list presents the following appearance, compared with several previous dates, all prices being in marks per ton:

	Before the War	Dec. 1, 1919	Feb. 4, 1920
Ingots	82.50	1,430	2,255
Blooms	87.50	1,465	2,285
Billets	95.	1,500	2,320
Slabs	97.50	1,505	2,325
Structural forms	118.	1,715	2,620
Bars, (Thomas steel)	98-100	1,745	2,650
Wire rods	117.50	2,000	3,150
Heavy plates	105.	2,285	3,435
Medium plates	110.	2,520	3,870
Thin	125.	2,585	4,035

An addition of 250 marks must be made to these prices when goods are made of Siemens-Martin (open-hearth steel). This difference hitherto had been 75 marks, after having been only 25 marks until last December. At the same time heavy rails have been raised to 2750-2800 marks, after a price of 1870-1900 marks had been adopted for Dec. 1. Rails for mines and temporary trackage were raised to the same figures. Grooved rails are now 3150 against 2220-2250 marks. One cause for all these advances was the adoption recently of a turnover tax on all business transactions. It is included in the prices here given.

Ore and Pig Iron Advances

Products not included in the above have also been marked up, from ores to the more highly finished products. The Siegerland Ore Syndicate advanced crude ores 70 marks a ton to 199.10 marks and roasted 105 to 298.40 marks. The Pig Iron Syndicate thereupon added a further 409 marks to hematite, 238 to German foundry, and 261 to Siegerland steel-making grades. Then a still further increase of 100 marks on hematite and 75 for other qualities were put on to cover the advance in coal.

Wire products have also been heavily advanced—drawn wire from 245 to 400 marks per metric cwt.; screw and rivet wire to 455; galvanized from 272 to 480 marks, barbed from 280 to 525 marks. There are certain extra charges to be added to these figures. The piping association has also advanced its list prices by 200 per cent on steel tubes, besides 150 marks a ton to counterbalance the advance of coal already mentioned.

The tendency of waste and scrap has also been strongly upward. While it is difficult to quote prices, it may be mentioned that one of the government bureaus in central Germany recently offered shell scrap at 2200 marks a ton. This was, however, regarded as flagrantly excessive and a protest was lodged with the military authorities here, the result of which is not known.

Great Advance in Bars

Wrought iron has also been sharply advanced. The raise was 1050 marks. The new prices are as follows: Commercial bars, 3270 marks; cast steel, 3350; rivet and chain bars, 3415 to 3550. These are prices in not less than 10-ton lots. Horseshoe bars have been raised 105 marks per metric cwt., making the bottom price 455 marks. The prices for axes and hatchets were raised 100 to 125 per cent for the home market and 350 per cent for export. The Bar Association has now adopted a scale of export prices for various countries in their own currency. Norway was raised to 450 crowns, Denmark to 500 crowns, while Sweden and Finland were left unchanged at 415 crowns. For Holland and its colonies the price is 230 gulden, for Switzerland, Italy and Greece 500 Swiss francs, for Spain 500 pesetas, for Belgium 1225 and France 1250 francs.

Exchange Situation Serious

The recent heavy depreciation of the exchange rates has been one chief cause for the advances in prices, and the continued further fall of the mark causes the gravest apprehensions in the trade, as it makes it more difficult than ever to pay for imported ores. The Pig Iron Association has decided to take special measures for meeting the difficult situation. It will change its terms of delivery so that iron intended for products for export shall be paid for in foreign exchange. The purpose of this is to prevent the manufacturers of finished products from taking foreign exchange in payment and leaving their bills abroad.

Meanwhile, it has been denied that an arrangement had been made between Swedish ore producers, to whom German iron companies owe large debts for ores, for turning over such claims to a Dutch firm—a report that was mentioned in my last letter. It now appears that German companies will continue direct financial arrangements with the Swedes. The project of putting an export duty on iron and steel sold abroad, to form a so-called compensation fund with which to assist importers of ore, is still talked of as likely to be adopted by the government.

The difficulties of ore production in the Siegerland region have increased and the output has dropped off. From 159,000 tons last July it dropped to 130,000 tons in December. The cause was the limited delivery of coal and coke, which caused a number of mines to be shut down. This has increased the demand for the minettes of Lorraine and Luxemburg; but most of the ores shipped from there go to Belgium or the regions west of the Rhine. Prices have been advanced to 10-12 francs a ton, which equals at present exchange rates 80 to 96 marks. Luxemburg foundry iron is also reported to be in great demand, with the price at 600 francs, or 4800 marks a ton—a price that effectually shuts it out of Germany.

Iron Trade and Government Disagree

The negotiations looking toward the organization of a self-governing body for the control of the iron trade, which have been going on between the government and the companies, apparently reached a position where an agreement seemed unlikely, and they were broken off about ten days ago. It is believed, however, that they will be resumed at a rather early date. The point of disagreement was over the government's right of veto, to which the producers strenuously objected, whereas the government's representative was equally firm in insisting upon that right. The matter

is discussed in the press from various political angles. Some of the papers strongly defend the government's position, holding that the representatives of labor on the governing board of the organization would be no adequate guarantee against undue price advances, as the labor men would readily consent to having prices raised in return for higher wages. At present there is no prospect that a harmonious settlement will be reached, and it is not improbable that legislation will be invoked.

The organization of the scrap and old iron dealers grew anxious that their interests would suffer through the proposed organization and sent a telegram to the Economic Minister, demanding representation in the conferences. The attitude of the Steel Works Association was shown in its answer, to the effect that it had already repeatedly discussed the waste and scrap question, but the questions involved were not yet cleared up, and so a conference with that trade would have no purpose at this stage.

Steel Consumers Take a Hand

During the past few days there have been conferences here in Berlin of some 50 representatives of various consumers' organizations. Almost with unanimity they demanded that the government assert its right of veto in the projected organization; also that the government should guarantee that prices be not raised too rapidly to the world market level. They also demanded a larger representation in the proposed governing board. They are given 12 of the 40 members, while the producers are to have 20 and the dealers 8. These representatives all along the line are to be equally divided between employers and employees.

According to the published project the governing board will have authority to fix maximum prices, the amounts to be exported and the percentage to be paid upon exports. The payments upon exports are to be devoted in part to making new imports of ores, the rest to paying off old ore debts. This is a substitute for the so-called compensation fund already referred to.

The advance in coal prices referred to above was 35 marks a ton, which was by far the greatest increase yet adopted. Hitherto the changes had been only 5 to 7.50 marks a ton.

Labor difficulties have broken out in the cutlery trade at Solingen. Partial strikes having occurred, the manufacturers have given notice that all shops will be shut down.

Disorganized Industries of Europe

A. T. Murray, president American Bosch Magneto Corp., Springfield, Mass., who has just returned from Europe, where he studied industrial conditions of the countries engaged in the war, takes a rather pessimistic view of the foreign situation. He makes the statement that with the exception of Germany, Belgium is the ablest nation which went into the war. Speaking of England, he says:

"She has gone back 10 years in the period since the armistice was signed. France to-day finds herself in the same position as England. Her industries are disorganized, principally because the nation never developed the constructive type of business men.

"Italy has come out of the war bled white. We must loan money to our Allies, but we cannot do so consistently without loaning them the brains and ability, and furnishing the structure on which to rebuild their industrial life. When we do this we assume a world leadership which will give security to the ideals which we took to the peace table."

Mr. Murray says he believes that Germany will have completed the subjugation of Russia within 30 or 40 years unless the United States realizes its obligations as the big brother of the world. He says America must compete alone against the impending alliance between Germany and Japan, because the rest of the Allies to-day are so far in their decadence that it will be hard to get more than a corporal's guard out of any of them, unless they are revitalized, when the time for the supreme struggle comes.

Chinese Use of Old Files and Horseshoes

The eccentricities of the Chinese race, from the American viewpoint, apply to their use of certain American iron and steel products. Arnhold Brothers, 21 State Street, New York, exporters and importers, recently advertised for "old steel files in quantities of 10 or 20 tons; also horseshoes." An interview with a member of the firm disclosed the fact that the Chinese delight in adapting commodities to uses for which they were not originally intended. For instance, darning needles they would enjoy converting into fish hooks or surgical instruments, apparently buying the needles and applying their craftsmanship rather than purchasing the article wanted, even though prices were no different.

Horseshoes are made over into razors, mallets and surgical implements and other cutting tools. Often they are simply straightened and used in ways of ordinary bar iron. The Chinese are particularly anxious to get horseshoes which have come from Belgium or northern France, believing that the constant pounding of shoes upon the granite sets (paving stones) changes their molecular arrangement and makes them adaptable for conversion into cutting instruments which hold their temper. According to Arnhold Brothers, American horseshoes are smaller than European because the horses in the former country are of lighter draft.

Files are often made into scraping instruments. Their ingenuity finds its counterpart in the American boy of years ago who made his own skates with wooden blades to which were attached old files for runners. Arnhold Brothers have found much difficulty in handling both files and horseshoes. To begin with, much care has to be taken to get what they want from the scrap men. Again, in transit, much of their consignment has been stolen by coolies. These commodities are frequently shipped in burlap bags, but barrels have proved much superior.

Orient Interested in American Foreign Trade

SAN FRANCISCO, March 1.—A total of 1215 American and Oriental business men are already listed as delegates pledged to attend the seventh National Foreign Trade Convention in San Francisco May 12 to 15, according to the Pacific Coast committee, Merchants Exchange Building, San Francisco, in charge. This is the first national foreign trade convention that has ever seated foreign delegates, and with 250 representatives of the Orient already accredited the degree of interest of the trans-Pacific countries in the convention is indicated.

The theme of the convention is to be "The effect of being a creditor nation"; but the convention will logically take on a Pacific atmosphere owing to the presence of 10 accredited delegates from all of the countries or their dependencies bordering the Pacific and from the further attendance of business men of those countries who will be accredited as delegates.

The latter decision was reached by the National Foreign Trade Council at New York and will undoubtedly have a large value in increasing the attendance of representative merchants and traders from the Pacific ocean countries.

Of the 1215 delegates already registered at the Pacific Coast headquarters 315 are from cities east of the Rocky mountains, 250 from the Orient, 150 from Seattle, 100 from Portland, 100 from Los Angeles and 300 from San Francisco.

Gray & Davis, Inc., Cambridge, Mass., has closed important new contracts for electrical and lamp equipment. The Pierce-Arrow interests have placed an order with the firm for its entire 1920-21 lamp equipment, the Stutz company is practically covered on its requirements and it is expected the Bethlehem Motors and Chandler will sign up within the near future. The company is doing a tremendous foreign business, chiefly British, on both electrical starting and lighting equipment.

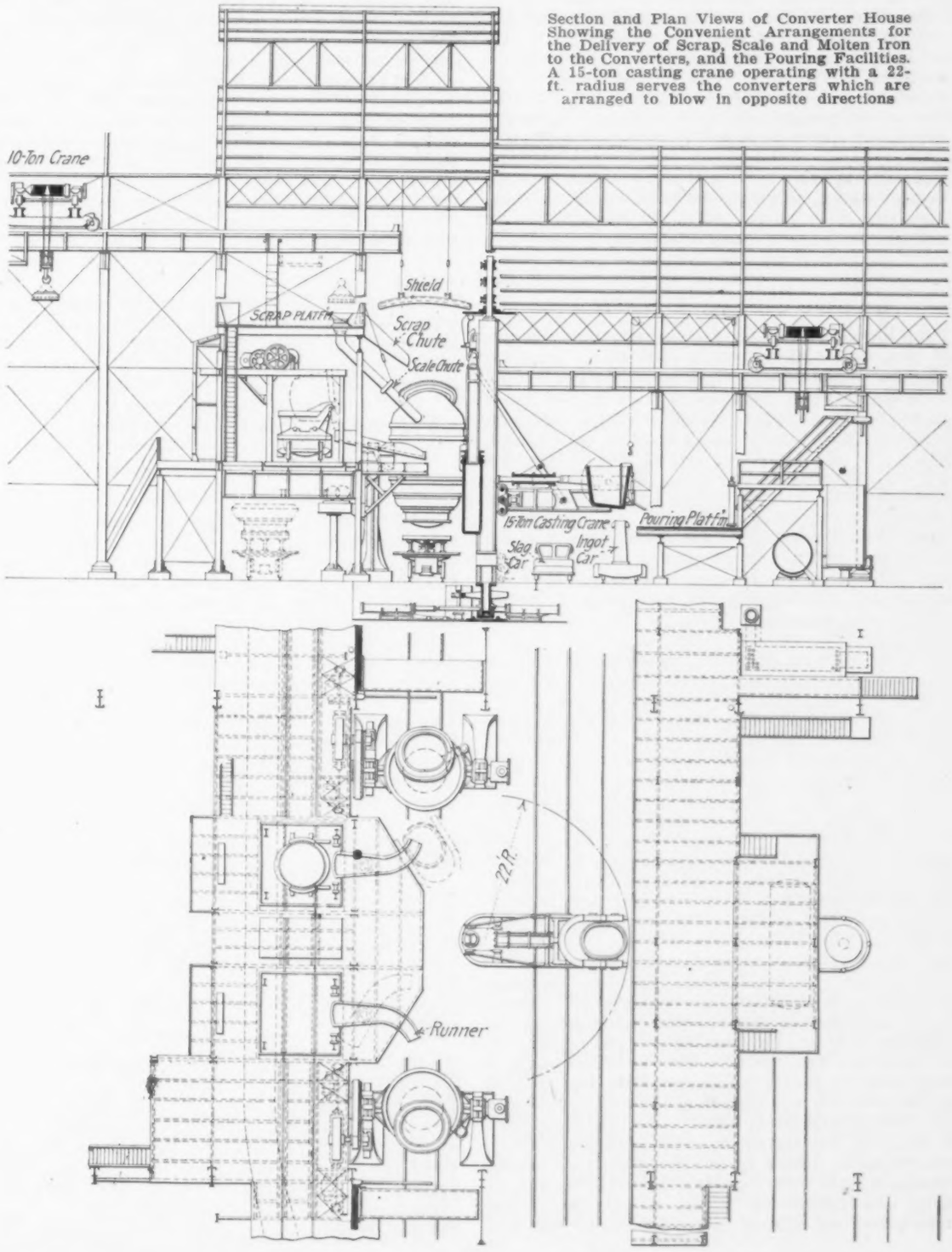
New Bessemer Plant in Indiana

Latest Developments in Design and Equipment to be Installed by the Steel & Tube Co. of America at its Mark Works

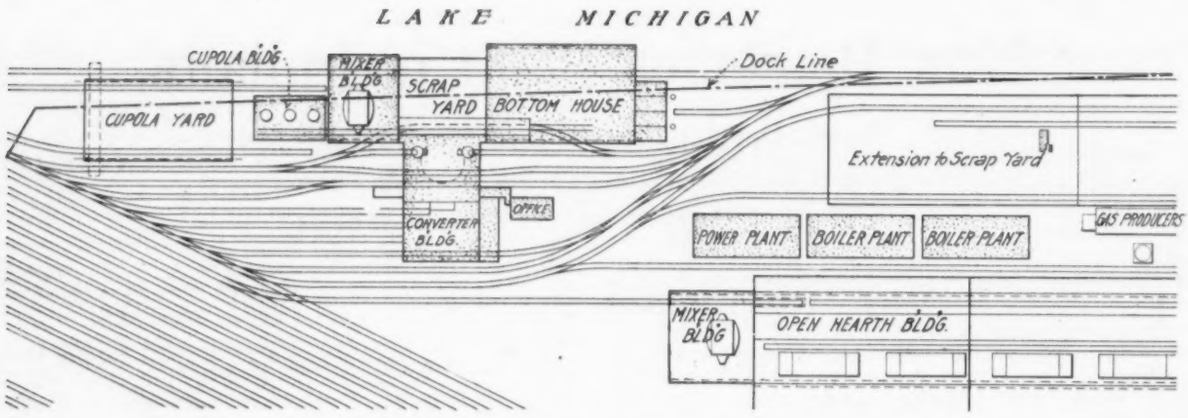
THE first fully equipped Bessemer plant to be erected for some time is now being constructed at the Mark works of the Steel & Tube Co. of America, Indiana Harbor, Ind. The improvements will include cupola, mixer and converter buildings, bottom house, office building, power plant and boiler houses.

The new plant will constitute an adaptation and further development of the best features of design and equipment, as brought out by previous experience in Bessemer practice, as well as those introduced in duplex works constructed within the past few years.

The cupola building, 40 x 66 ft., will contain three cupolas, each of 20 tons capacity per hr.. which will be served by a double electric hoist carrying two buggies on each platform. Each cupola will be provided with an independent blower with a capacity of 10,000 cu. ft. per min., and a maximum pressure of 14 ounces. On one side of the cupola house will be a cupola yard,



Section and Plan Views of Converter House Showing the Convenient Arrangements for the Delivery of Scrap, Scale and Molten Iron to the Converters, and the Pouring Facilities. A 15-ton casting crane operating with a 22-ft. radius serves the converters which are arranged to blow in opposite directions



Plan View of Bessemer Plant, Showing Arrangement of Constituent Structures and Their Relation to Older Portion of Mark Works. Part of the buildings will extend beyond what was formerly the shore line of Lake Michigan, the lake having been filled in at this point. The new buildings are shown stippled

97 x 140 ft., served by a 10-ton Morgan electric crane, and on the other side will be the mixer building, 66 x 75 ft., which will house a 600-ton mixer. Adjoining this structure will be a scrap yard, equipped with a 10-ton Morgan electric travelling crane. This yard will be bordered on two other sides by the bottom house, 86 x 140 ft., and the converter building, 68 x 190 ft. The latter will contain two 15-ton converters arranged to blow in opposite directions. These will be served by a center hydraulic crane.

The office building will be situated adjacent to the converter building, while the power plant, 42 x 100 ft., and the two boiler houses, 40 x 100 ft. each, will be located next to the existing open hearth plant to facilitate the use of waste heat from the furnaces under the boilers. The power house will contain two steam driven turbine blowers, which will deliver 25,000 cu. ft. of air against 30 lb. pressure, and a 2500-kw. Westinghouse turbine generator.

The Bessemer plant throughout was designed by the Steel & Tube Co.'s own engineering staff, under whose direction it is being built. The converters and cupolas will be furnished by the Pennsylvania Engineering Works, New Castle, Pa., and the blowers by the Ingersoll-Rand Co., New York. The mixer will be constructed by John Mohr & Sons, Chicago. The Worden-Allen Co., Milwaukee, is fabricating the steel for the new structures.

An Ohio Company in the War

"Our Part in the World War" is the title of a souvenir book containing numerous illustrations issued by the Morgan Engineering Co., Alliance, Ohio, and dedicated to the Ordnance Department of the United States Army and to the employees of the Morgan company. A review is given of the company's work in building gun carriages for the Ordnance Department before and during the Spanish-American war. Early in the World War, the company designed and built 30 complete plants for Russia for forging steel shells.

Soon after the United States entered the war, the company was called upon to design and build field mounts for 5-in. and 6-in. guns that were dismantled from seacoast fortifications and battleships, these requiring a new design of mount as they were of a heavier type than were used for field artillery. One of the manufacturing problems that developed because of the urgent demand for early delivery was the production of the large 6-ft. diameter steel wheels. These, as originally designed, were tractor type wheels, each composed of over 300 separate pieces, the rims being formed of rolled steel rings. It was found impossible to secure these rims and had they been available, the machine work would have greatly delayed deliveries. The problem was solved by the development of a one-piece cast-steel wheel weighing 2750 lb., which could be made at the rate of 20 per day and the only machine work required was to bore the hub for bronze bushings. Later the company was given an order for Barbette 8-in. gun carriages, which are mounted on steel railroad cars.

On Dec. 8, 1917, a contract was placed with the Morgan company for mounting 91 12-in. mortars taken from seacoast fortifications in carriages on railroad cars and this order, which was one of the largest placed in carrying out the Government's artillery program, necessitated the erection of a new ordnance plant, a portion of which was placed in operation four months after the contract was signed and the plant was entirely completed June 1, 1918. This plant provided floor space of 250,000 sq. ft., was equipped with 20 electric traveling cranes up to 100-ton capacity, nearly 400 machine tools with individual motor drive, and its capacity was limited only by the weight which could be transported on railroad cars. Production was gotten under way so rapidly in this immense plant that when the armistice was signed every casting, forging and structural part for the 91 railroad mounts was completed and, despite the relaxation of tension after the armistice, 45 complete units had been delivered up to April 7, 1919, or five more than General Pershing had asked for in planning his 1919 drive.

American Tap & Die Corporation Sold

Control of the American Tap & Die Corporation, Greenfield, Mass., has changed from the hands of Walter E. Nichols to Albert B. Allen. This transaction makes the second in which a Greenfield tap and die company has come under new management within the past month or two the other case being the Greenfield Tap & Die Corporation.

Mr. Nichols has been president of the American Tap & Die Corporation since its conception. The business originally was located at Bernardston, Mass., under the firm name of the E. S. Hurlbert Co. Mr. Nichols and his brother, J. Henry Nichols, bought the business and gradually increased it until it was necessary to acquire larger quarters. The firm then moved to Greenfield, and the plant since then has been enlarged considerably. Originally butchers' tools were made and cutlery, but some years ago the company installed a branch department for the manufacture of taps and dies, which has become an important one.

Following the transfer of Mr. Nichols' holdings in the company, the directors elected Mr. Allen president. Mr. Allen for many years was cashier of the First National Bank, Greenfield, and on Jan. 1 last, was made treasurer of the American Tap & Die Corporation.

Mr. Nichols has made no plans for re-entering business.

The 44- and 28-inch rolling mills and four open-hearth furnaces of the Steelton, Pa., plant of the Bethlehem Steel Co. were put in operation late last week after being closed for almost a month by reason of a coal shortage, and now all departments of the plant are in operation. Operation at Steelton was curtailed by 50 per cent on Feb. 8, when the situation became acute. Operations in departments were resumed gradually.

BUSINESS MEN WIN

Appropriation for Foreign Trade Raised by National House of Representatives

WASHINGTON, March 9.—Business men and commercial organizations demonstrated their influence upon Congress last week when they brought about the restoration of items for the promotion of foreign trade in the annual legislative, executive and judicial appropriation bill. The bill as finally passed by the House carries appropriations for the Bureau of Foreign and Domestic Commerce equal to the amounts for the current year. While the Department of Commerce had asked for large increases, its officials were well satisfied to get the same amount as for the current year in view of the cuts made by the Appropriations Committee.

While the measure must go before the Senate Appropriations Committee, and later before the Senate, there is little prospect that any further reductions will be attempted. In fact, the Department of Commerce is likely to be given additional amounts before the Senate finishes with the bill. The whole fight was won apparently on the floor of the House.

So far as appropriations for the Bureau of Standards of the Department of Commerce were concerned, the reductions made by Committee on Appropriations have stood without change. The attention of officials of the department, and of business men, was concentrated on the items for promotion of foreign trade while the bill was before the House. It is probable that some increases for the Bureau of Standards will be made by the Senate committee.

The appropriations for the Board of Foreign and Domestic Commerce during the current fiscal year have totaled about $910,000. Instead of increasing that amount by several hundred thousand dollars, as had been requested, the subcommittee of the House Committee on Appropriations reduced it to $487,000, or not much more than half of what was available this year. By the action of the House, after a fight on the floor continuing the greater part of two days, the appropriation goes back to approximately $910,000.

The Real Issue

The real issue involved proved to be whether overlapping exists between the work of the Department of Commerce and the Department of State in promoting foreign trade, and whether the work abroad should not be handled exclusively by the State Department, as is contended by some. The speeches in the House reflected the sentiment of business interests throughout the country, which preferred to have the work done so far as possible by the Department of Commerce. The divergent views on this proposition are shown in extracts from the remarks made by Representative Wood, who criticized the work of the Department of Commerce, and by Representative Edmonds, of Pennsylvania, who cited an instance in his experience showing the difference between the trade promotion policies of the two departments.

"I feel that it is my duty to bring before this House and the country a condition, not a theory, that exists concerning this matter," said Representative Wood. "Evidence has already been heard here which, if true, should be conclusive to the minds of gentlemen who have heard it that the consular service of the State Department, in so far as it has to do with our foreign trade, should be absolutely abolished. We have to-day in the service of this Government a few more than 400 consuls general. They encircle the globe, and with their supernumeraries and assistants we have upon the pay roll of the consular service more than 2000 names of people supposed to be engaged in looking after and extending the foreign trade relations of the United States. If they are not doing it, they should be relieved from making a further pretense at doing it. We are appropriating, in round numbers, $9,000,000 a year for the support of our embassies and consular service. Far more than one-half of that amount of money is expended for the consular service alone. I am told by those who have had years of experience that more than three-fourths of the activities of the office of a consul general consist in looking after our foreign trade relations. Last year we appropriated, in round numbers, $900,000 for our foreign trade relations through the Department of Commerce. That, together with the amount that is appropriated for the Department of State for this same service, amounts, in round numbers, to more than $5,000,000. Somebody is spending entirely too much money for the returns we are getting.

Service of Consular Agents

"There is a great mistake, innocently made, no doubt, with reference to the amount of our foreign trade service, that can rightly be credited directly to the Department of Commerce. More than three-fourths of the information received by the commercial world is gathered not by commercial agents from the Department of Commerce, but by the consular agents under the State Department. Under the law all of this information comes first to the State Department, where matters of diplomacy are sifted out, and the commercial information of importance goes to the Department of Commerce, which issues its reports daily or weekly, or as called upon, as the case may be. But the people generally have the impression that this is a peculiar activity of the Department of Commerce, when as a matter of fact the information thus gathered, as the evidence discloses, is more than three-fourths information that comes from the Department of State."

Representative Edmonds told of an experience with one of the State Department representatives in Japan. "In 1915 I was in the consular office in Kobe, Japan," said he. "There was a man who came in there, a Japanese, who wanted to buy some files. He realized that at that time the war was on. England had supplied this market, but most of the factories of England had been taken up in making munitions and could not supply the trade, and this man was hunting for new sources of supply. The consular agent said, 'I will take your request down and send it on.' I said, 'What will happen now?' after the man went out. He said, 'I will send it to the State Department, and when they get ready they will send it over to the Department of Commerce, and they will publish in a little paper something like this: "3284. A man in Kobe, Japan, would like to have some files." In six months from now the man may or may not get an answer. In the meantime he has bought his files. This is the regulation of the State Department in connection with this business. I know file manufacturers in the United States and could give him the names of half a dozen, but it is absolutely impossible for me to say anything to this man or give him any information at all so that he can get his files within any sort of reasonable time.'

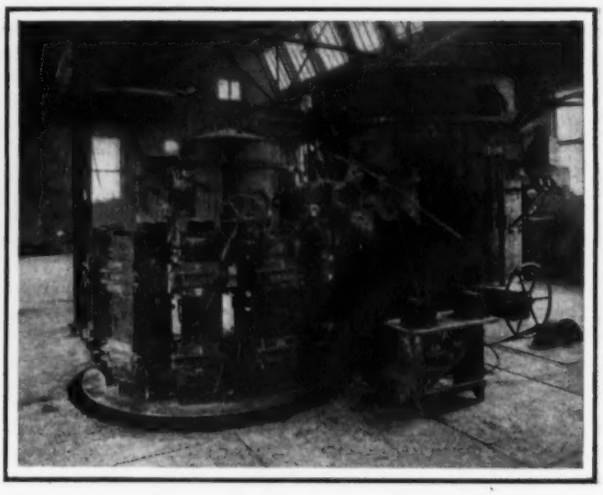
"This is true of all the consular offices. Several consuls spoke to me about it. I sent them a Pennsylvania directory of manufacturers, so that they could get a list of men by reading it. A consular agent can not get along with these other duties without stultifying himself by advocating any particular establishment. The agent from the Department of Commerce can take the names and supply them to the manufacturers. They can get the supplies quickly. If we continue this through the State Department, we will just waste our money.

"That is the opinion of everybody who knows anything about the work of the State Department in connection with the building up of trade. We should take it away from the State Department. It should be placed absolutely in the hands of the Department of Commerce."

While those seeking to slash the foreign trade promotion items based their arguments on grounds of economy, their pleas in this direction were pretty well shattered by Representatives Mann and Madden of Illinois, both of whom have the reputation of being watch dogs of the Treasury. Representative Mann took the floor in behalf of the increase in the fund for the promotion of trade with the Far East.

Nose Tilting Furnace Pours Direct Into Molds

A new nose tilting melting furnace, motor operated, and rotating casting table which permits pouring direct from the furnace to the molds and designed for use in making slabs in brass rolling mills, has been brought out by the Electric Furnace Co., Alliance, Ohio. It is pointed out that there is a decided advantage in pouring directly from the furnace to the molds, owing to the fact that with one pouring there is less loss of zinc than there would be were the metal poured into a ladle and from the ladle to the molds, and with the direct pouring it is not necessary to bring the metal to as high a temperature as otherwise would be required to take care of the chilling effect of the ladle. There is also the saving of labor. Under ordinary methods of operation one man is required for handling the furnace and two for the ladle. With this equipment one man does all the work of handling the furnace and pouring into the molds.



Nose Tilting Motor Operated Melting Furnace Which Pours Direct to Molds Carried on a Rotating Table

The melting unit is a standard 105-kw. furnace with a capacity of 2000 lb. built along standard lines but with motor operated tilting mechanism. Instead of being tilted by center trunnions, the furnace swings on two brackets, resting on pedestals on the pouring side, so that the position of the nose is not changed when the furnace is tilted. The tilting mechanism, located at the back of the furnace, includes a miter gear operating a threaded nut resting on a roller bearing set in a cradle, so as to provide an angular motion to take care of the arc described by the lifting screw, directly under the rear of the furnace.

The casting table, which is set in the floor, has a steel plate top, which is adjusted by four lifting screws that are operated by a 5-hp. motor through gears and sprockets. The same motor is used for rotating the table when the molds are being poured. The molds are set on the table in a circular position and after one is poured the table is moved a few inches to bring the next mold under the pouring spout. The table is designed for taking any standard type of brass rolling mill slab mold, and has a capacity of one ton of slabs. Two controllers are located at the side of the furnace, so that the operator while standing in one position controls both the furnace tilting and the table operating mechanism.

National Cash Register Co. Plan

The National Cash Register Co., employing approximately 7000 people in its plant at Dayton, Ohio, has announced a plan for equal division of profits with its employees for 1920. Only employees in the Dayton plant of the company will share in the profits. John H. Patterson, president of the company, announced that the profits will be determined by outside accountants, and that after the net profits have been determined, an amount equal to 6 per cent interest on the company's investment will be deducted. The remaining profits, the statement said, will be divided into two equal shares, 50 per cent to the company and 50 per cent to be divided among the employees.

American Clays Superior

WASHINGTON, March 9.—There are 13 American clays ranking higher than the German Klingenberg clay for the making of steel melting crucibles, according to tests made by the Bureau of Mines. Prior to the war American brass and steel manufacturers held that graphite from Ceylon and German Klingenberg clay were necessary in the making of brass and steel melting crucibles. Consequently most of the graphite and bond clay used in the manufacture of crucibles was imported.

The Bureau of Mines began experiments to see if the so-called inferior American clays would answer the purpose. Over 450 full-size crucibles have been made at the ceramic station of the Bureau of Mines at Columbus, Ohio, and tested in brass making and steel smelting. Two different tests made on brass melting crucibles in two different foundries indicate that the domestic flake graphite gives a crucible of greater service than those made from Ceylon graphite. The Bureau of Mines states that these two tests are not sufficient to be conclusive and more extensive tests are now in progress to determine this point.

Of the bond clay tests, the bureau states that the work has been sufficiently thorough to indicate that there are two American clays superior to the German Klingenberg clay for bonding brass melting crucibles and that there are 13 American clays ranking higher than the Klingenberg clay for steel melting crucibles.

In so far as bond clays for graphite crucibles are concerned, the Bureau of Mines says the United States is now nationally independent, the hold which the German Klingenberg clay held on the crucible trade having been finally broken. It is declared that the United States will never return to the use of Klingenberg clays.

Reducing Agents for Electric Furnaces

"Electric Furnace Reducing Agents" will be one of the subjects discussed at the monthly meeting, Feb. 27, at 8.30 p. m., of the New York Section of the American Electrochemical Society. The subject will be introduced by W. S. Landis, chairman of the section, New York.

The Standard Supply & Equipment Co., Philadelphia, has bought the Brierly-Lombard Co., Worcester, Mass., mill supplies. John T. Brierly, president, founder and manager of the business, retires. The new owner will use the Worcester branch as the distributing station for Boston and New England. The Brierly-Lombard Co. is capitalized for $150,000.

STOCK DIVIDEND DECISION

Some Steel Companies Will Enlarge Capital—Court's Position Approved

WASHINGTON, March 9.—In a five to four decision, the Supreme Court has held invalid the provisions of the income tax law of 1916 taxing as income stock dividends declared by corporations out of earnings and profits accumulated since March 1, 1913. The case was of more than ordinary importance, affecting many thousands of persons who have been taxed. Under the decision, they will be entitled to a refund.

The court affirmed the findings of the District Court of the Southern District of New York in a case brought by Myrtle H. Macomber after paying $1,367 under protest as a tax on 1,100 shares of new stock received in January, 1916, as a stock dividend from the Standard Oil Co. of California. Justice Pitney in the majority opinion said:

"A stock dividend shows that the company's accumulated profits have been capitalized, instead of distributed to the stockholders or retained as surplus available for distribution in money or in kind, should opportunity offer. Far from being a realization of profits of the stockholder, it tends rather to postpone such realization, in that the fund represented by the new stock has been transferred from surplus to capital and no longer is available for actual distribution.

"The essential and controlling fact is that the stockholder has received nothing out of the company's assets for his separate use and benefit; on the contrary, every dollar of his original investment, together with whatever accretions and accumulations have resulted from employment of his money and that of the other stockholders in the business of the company, still remains the property of the company and subject to business risks which may result in wiping out the entire investment. Having regard for the very truth of the matter to substance and not to form, he has received nothing that answers the definition of income in the meaning of the Sixteenth Amendment.

"Being concerned only with the true character and effect of such a dividend when lawfully made, we lay aside the question whether in a particular case a stock dividend may be authorized by the local law governing the corporation, or whether the capitalization of profits may be the result of correct judgment and proper business policy on the part of its management and a due regard for the interests of the stockholders.

"From every point of view we are brought irresistibly to the conclusion that neither under the Sixteenth Amendment nor otherwise has Congress power to tax without apportionment a true stock dividend made lawfully and in good faith, or the accumulated profits behind it. In so far as it imposes a tax upon the stockholder because of such dividend, it violates the provisions of Article I, section 2, clause 3, and Article I, section 9, clause 4 of the Constitution, and to this extent is invalid notwithstanding the Sixteenth Amendment."

O. F. S.

Decision Well Received

The decision of the United States Supreme Court in the stock dividend case means that the directors of the Crucible Steel Co. will act with greater rapidity in declaring the $50,000,000 common stock dividends authorized by the directors and approved by the stockholders, than if the decision had been unfavorable, according to Horace S. Wilkinson, president and chairman of the board. Mr. Wilkinson added:

"The decision was just, and such as was to be expected. I do not see how business could be conducted on a basis other than the right to make its present capital and cost of plants, vessels, etc., somewhere near the actual cost of production of competitive plants and facilities. I do not see how a man can build a plant now, say, at a cost of $2,000,000, and compete with one that cost only $500,000 in 1915 and 1916 unless the capital stock and costs of operation were based on the present cost and an adequate return on the new capital invested.

"The decision of the Supreme Court in declaring that the Steel Corporation does not contravene the anti-trust law, coupled with the decision in the stock dividend case, leaves business in a position where it can now proceed without fear of government intervention in its activities."

A telegram to THE IRON AGE from Youngstown, Ohio, says:

"Both the Youngstown Sheet & Tube Co. and Brier Hill Steel Co. will likely declare common stock dividends within a short time, following the favorable Supreme Court decision, which was enthusiastically received in financial and industrial circles."

Similar action may be taken by other companies.

DISTRIBUTION OF COAL

Suit Is Brought to Restrain Director General of Railroads Hines

WASHINGTON, March 9.—The American Wholesale Coal Association has commenced suit in the Supreme Court of the District of Columbia to restrain Director General of Railroads Walker D. Hines from continuing to control the distribution of coal. The case has been brought in the name of Swayne & Co., Philadelphia, merchants in coal, coke, pig iron, etc. Noah H. Swayne, 2d, head of this company, is president of the American Wholesale Coal Association. Another somewhat similar suit was brought recently by a utility corporation of New Haven, Conn.

It is contended in the petition filed in the Swayne case that the President's control over coal as granted by the Lever law, has been delegated and redelegated so many times that the coal industry is no longer regulated by the Government in the public interest. Instead, it is contended that anyone who uses coal and wants to confiscate what he desires can get and use all the President's power under the Lever law.

Specifically, it is pointed out that the President delegated his authority to Dr. H. A. Garfield; Dr. Garfield redelegated it to the Director General of Railroads; the Director General of Railroads gave it to the Central Coal Committee; the Central Coal Committee passed it on to regional committees; the regional committees transferred it to the Federal managers; the Federal managers allotted it to their fuel agents; and the fuel agents used this authority to get coal for some of their friends along their railroad.

The bill questions the legality of such frequent delegations of the President's power.

A second allegation is that those who thus regullated coal in their own interest assumed still in their own interest to divest the owners of coal of their title to it.

The third allegation is that an organization—the Central Coal Committee—consisting of three men and two clerks, had tried to distribute about 2,000,000 tons of coal per day. They had no force adequate to investigate either the truthfulness of statements of coal users or to determine whether the man whose coal was taken needed it as badly as the man to whom it was being given.

The fourth allegation is that under this system men who have spent their money to finance the coal mines during the recent strike had to sit by while their funds were tied up by the Railroad Administration which worked under rules that made it impossible for them to recover what they actually had spent for coal, to say nothing of collecting enough additional to pay their cost of doing business.

At the end of the petition the plaintiff requests that the court establish a commission to settle claims between the owners of the coal and the divertees. They also ask that the Director General of Railroads be ordered to show cause why an order should not be

issued restraining him from further illegal interference with their business.

While the suit is filed in the name of Swayne & Co., it is specified in the bill that it is in behalf of the 600 members of the American Wholesale Coal Association. It requests the Supreme Court of the District of Columbia to consider this a test case and to allow the wholesalers to intervene as individuals to establish their rights.

Coal distribution committees have been appointed by Director General Hines, following the turning back of the railroads. The committees are instructed to exercise no more authority than necessary and to cease control at the earliest possible moment.

Increased Activity at Belgian Iron and Steel Works

First Awards Made on Damages for German Destruction—Advances in Iron and Steel Prices and in Shares of Producing Companies

(*Special Correspondence*)

BRUSSELS, BELGIUM, Feb. 15.—Further progress is reported in the resumption of the Belgian iron and steel industry. At Haumont, La Providence Belge has restored its sheet mill installation. At Rehon two blast furnaces and a steel plant are at the height of activity. At the Marchienne plant, where the old installations were completely destroyed or taken away by the enemy, work has begun on the construction of a modern steel plant which will greatly reduce the amount of hand labor required. It is figured this will be in operation at the end of the year.

At the Ruau rolling mills at Monceau-sur-Sambre work is progressing on the re-installation of two divisions. The bolt plant of this company has been in operation for two months at one-third capacity. The modern equipment which has been ordered will permit, with a reduced working force, production as great as that of 1914 by next April. In the rolling mill division, where the electrical plant remained practically intact, it is hoped to start the smaller mill by April 1. The company also has become interested in a concern in the north of France where it expects to have a bolt plant in operation next month.

The four blast furnaces of the Sambre et Moselle company have not been lighted because of difficulty in procuring ore in view of insufficient transportation facilities. This concern buys semi-finished material from other producers and rolls it in the few mills that have been put in condition. At the Chatelineau division the sheet mill is operating.

The Thomas and Martin process plants of Metallurgique du Hainaut at Couillet are working three shifts a day and it is expected soon to have the blast furnace and rolling mill capacity on in full.

Ougrée-Marihaye at Liége has put another blast furnace in operation, as well as a rolling mill. This company, which has just started up an old coke oven plant will have another battery in operation soon.

Despite the lack of half finished steel, poor transportation facilities and lack of coke, it is expected that several metallurgical plants will be operating in the early spring and that those which are already working will increase their production.

The balance sheet up to June 30, 1919, of J. Sichel & Co., Luxemburg, shows a net profit of 1 234,433 marks. The capital has been increased from 4,000,000 marks to 16,000 000 marks. One-half will be subscribed by the Ougrée-Marihaye company and 4,000,000 marks by an association which will offer half to present stockholders at 215.

First War Indemnities to Steel Companies

The Monceau St. Fiacre company has received a provisional allowance of 16,000,000 francs on the amount of indemnity it will receive for war damages. The Sambre et Moselle company has received a provisional indemnity of 4,000,000 francs out of 32,000,000 francs estimated damage. The Cockerill company's provisional award amounts to 120,000,000 francs.

The Acieries d'Angleir company has increased its capital from 10,000,00 to 20,000,000 francs by the issue of 20,000 new shares. The company, it is announced, will participate to the extent of 9,000,000 to 10 000,000 francs in the Differdange Iron & Steel Co., formerly owned by the Deutsche Luxemburgische company.

The Esperance-Longdoz company, which has two blast furnaces, steel works and sheet bar and other mills at Liége, plans soon to increase its capital by the 35,000 new shares with which it expects to procure about 11,875,000 francs to finish present construction.

Steel shares have made sensational bounds lately, Providence Belge, for example, going from 4700 to more than 6500 francs; Ougrée from 2000 to nearly 2500, and Baume et Marpent from 2870 to 3300 francs.

Thomas pig iron which in June, 1914, was worth 65 francs per ton rose to 360 francs in December, 1919, and to 600 in January, 1920. Merchant iron worth 150 francs in 1914 went to 975 francs last month. Rails are worth now more than 900 francs a ton, against 155 in 1914 and 500 last June.

Les Usines de L'Esperance at Louvroil will at its forthcoming meeting consider the question of a fusion with the Societies des Acieries du Nord et de l'Est.

Youngstown Plants Crippled

YOUNGSTOWN, OHIO, March 8.—Crippled steel plant operations, due to the fuel shortage, were accentuated to-day. Both the Youngstown Sheet & Tube Co. and Republic Iron & Steel Co. are operating below 50 per cent normal. Monday the Sheet & Tube company had only three of 12 open-hearth furnaces producing steel. The management resorted to the use of tar, obtained from the by-product coke ovens, as substitute for coal. Less than 350 cars of coal for industrial uses were available Monday, compared with minimum requirements of 750.

Will Build Bessemer Plant

The Great Western Iron & Steel Co. Des Moines, Iowa, has been incorporated with $5,500,000 capital stock and will build a Bessemer steel plant to cost $4,000,000. The first converter is expected to be ready for operation by the end of the year. M. J. Holland is president of the new corporation and the other officers include Neal Garrett, vice-president; George L. Towne, second vice-president; K. M. Holland, secretary, and A. E. Minetor, treasurer. Temporary offices are at 517 Clapp Block.

Traveling Exhibition Proposed

The British Department of Overseas Trade, similar to the United States Department of Commerce, is considering plans for a traveling exhibition of British manufactured products. The department estimates that such an exhibit, preceded by motion pictures and in charge of competent men to place buyers in communication with the manufacturer, could be maintained for a period of two years at a cost of about $1,000 to each exhibitor. If the plan is put into operation, the first tour will be in the British dominions.

New York Steel Treaters March Meeting

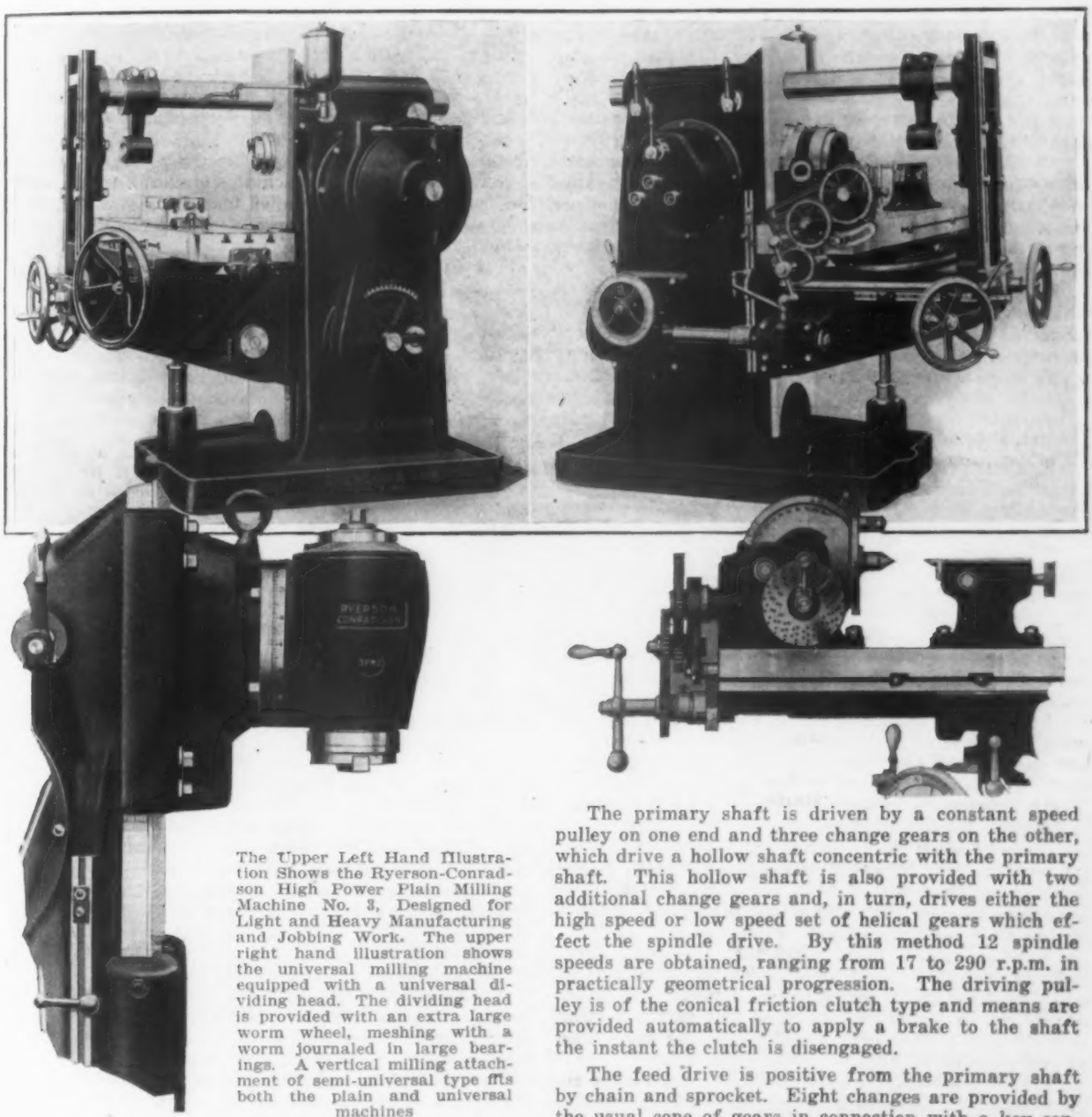
The March meeting of the New York Chapter of the American Steel Treaters Society will be held Wednesday evening, March 17, at the Bush Terminal Building, Forty-second Street, New York. Major A. E. Bellis of the Springfield Armory, Springfield, Mass., will read a paper on "Tool Hardening," which will be followed by a general discussion. An informal dinner at the Café Boulevard will precede the meeting.

Milling Machine With Helical Drive

In THE IRON AGE of Jan. 29, it was announced that Joseph T. Ryerson & Son would handle the output of the new Conradson Machine Tool Co. plant, Green Bay, Wis. The first of the Ryerson-Conradson line of machines, a No. 3 high-power milling machine, was recently put on the market. A feature of this tool is the helical drive, used to insure a steady drive, thus to lengthen the life of the milling cutter and increase the quantity and quality of output. Heretofore helical drive gearing has not been universally employed on milling machines because of the inability of builders to secure a sufficient range of speeds for commercial milling purposes. This obstacle, it is stated, has been overcome in the Ryerson-Conradson machine, which is designed for light and heavy manufacturing and jobbing work. The column is ribbed internally and cast integral with the base. Surrounding the base is a deep flange which stiffens it and serves as an oil retainer. The face of the column is extended above the overarm affording a support for special fixtures. A heavy type vertical milling attachment, having this solid backing, takes as heavy a cut as the main spindle. The bearing surface between the knee and the column has been increased by extending the back of the knee up to a point nearly level with the top of the table. The elevating screw telescopes and is located in the center of gravity to prevent binding action when raising or lowering the table.

The table has three T-slots and a large groove to retain and lead all cutting compounds to the drain. The hand wheel for longitudinal table travel, which extends diagonally from the side of the saddle on the plain milling machine, is found in the shape of a crank on the end of the table in the universal miller. The plain and universal machines differ in this feature and in that the latter has a swivel base for the table.

The front spindle bearing is tapered and both bearings are adjustable for wear. The face plate is forged integral with the spindle and arranged with two large keys for driving face mills and arbors.



The Upper Left Hand Illustration Shows the Ryerson-Conradson High Power Plain Milling Machine No. 3, Designed for Light and Heavy Manufacturing and Jobbing Work. The upper right hand illustration shows the universal milling machine equipped with a universal dividing head. The dividing head is provided with an extra large worm wheel, meshing with a worm journaled in large bearings. A vertical milling attachment of semi-universal type fits both the plain and universal machines

The primary shaft is driven by a constant speed pulley on one end and three change gears on the other, which drive a hollow shaft concentric with the primary shaft. This hollow shaft is also provided with two additional change gears and, in turn, drives either the high speed or low speed set of helical gears which effect the spindle drive. By this method 12 spindle speeds are obtained, ranging from 17 to 290 r.p.m. in practically geometrical progression. The driving pulley is of the conical friction clutch type and means are provided automatically to apply a brake to the shaft the instant the clutch is disengaged.

The feed drive is positive from the primary shaft by chain and sprocket. Eight changes are provided by the usual cone of gears in connection with a key controlled by a hand wheel, on the circumference of which the various rates of feed are indicated. Two sets of gears, operated by a hand lever, double the eight feeds, thus giving 16 feed changes ranging from 0.6 in. to 22.3 in. per min. Each feed screw has a graduated dial reading to thousandths and readily set back to zero. All feeds are equipped with fixed trips and one adjustable trip which can be placed to stop the table at any desired position along its travel. The table is provided with a universal swivel vise with graduated base.

The dividing head has a large worm wheel, meshing with a worm journaled in large bearings. Means

are provided for quickly disengaging the worm from spindle and to take up backlash. The spindle and face plate are forged in one piece thus to provide a rigid arrangement for mounting chucks and fixtures. The face plate is 8 in. in diameter and has 24 holes for direct indexing. The centers will swing 14¼ in. in diameter. The head is graduated and can be clamped in any position from 10 deg. below horizontal to 10 deg. beyond the perpendicular. Regular equipment consists of three index plates that divide all numbers to 50 and many beyond, wrenches, bolts, driving dog, and index table giving all divisions up to 360.

Both the plain and universal milling machines are provided with vertical milling attachments of semi-universal type, made in light, medium and heavy patterns. The base of the attachment is clamped to the column of the machine dovetail, no dependence being placed on the overarm. The drive is by a large aluminum bronze gear bolted to the face plate of the main spindle and driven by the cross key. In turn, it engages a steel gear on a horizontal shaft, driving the vertical spindle through a set of bevel gears. This permits the spindle to be set at any angle parallel to the face of the column. A draw-in bolt is furnished.

The No. 3 milling machines are driven at a constant pulley speed of 600 r.p.m., requiring from 5 to 7½ hp. to operate. The gears run immersed in oil and are completely inclosed, making them dust-proof, and owing to the flooded lubrication, practically noiseless. The driving pulley is also inclosed. Thrust is taken up by S. K. F. ball-bearings, all of which are bronze bushed. Change gears are all cut from solid chrome nickel steel stock and are heat treated; all others are of steel or bronze, no cast gears being used with the exception of the large elevating bevel gear, which is of cast steel.

Manganese Ore in Central America

WASHINGTON, March 9.—The Geological Survey has issued an interesting report on manganese deposits in Costa Rica and Panama. Both investigations were made by J. D. Sears, an American geologist.

"The deposits in Costa Rica," says the report, "are found at several places on the Nicoyan peninsula, in the province of Guanasacte, which extends along the Pacific coast. Most of the known deposits and all those which have been the source of the shipments, lie within about 16 miles of Playa Real on the Pacific coast in the northern part of the peninsula. Other isolated deposits occur in the eastern part of the peninsula, near the Gulf of Nicoya. Although deposits of manganese oxide were examined at 36 places near Playa Real, most of the ore shipped has been derived from three deposits that lie in an area of scarcely 1000 sq. ft. at Playa Real. These deposits are owned by the Costa Rica Manganese & Milling Co., an American company. At Playa Real, as at many other places in the region, the manganese oxides form very irregular masses which appear to extend along the crests of hills, but sufficient work has been done to show that only a few persist for as much as 100 ft. below the surface. Estimates of the size of the known deposits, based upon very inadequate data, indicate that they might yield 10,000 to 15,000 tons in addition to the 18,000 tons already shipped. The oxides are intimately mixed with silica, so that careful sorting is necessary to produce material containing more than 45 per cent of manganese.

"The deposits in Panama lie in an inaccessible region along the Boqueron River about 20 miles northeast of Colon. They are about 12 miles southwest of the deposits at Nombre de Dios, which were extensively explored from 1871 to 1902. These deposits are poorly exposed and only a few of them have been explored, but the indications in two small areas warrant an estimate that the deposits there may yield 25,000 to 30,000 tons of high-grade oxides. In order to export the material, however, roads or tramways must be constructed at considerable expense." O. F. S.

The rolling mills of the Helmbacher Forge & Rolling Mill Co., Madison, Ill., which had been closed for more than a year, opened on Feb. 25, with considerable work ahead.

Proposed Canadian Consolidation Discussed

Directors of the Dominion Steel Corporation, after a three hour session at Montreal, March 5, dispersed without arriving at any definite decision in the matter of the much-discussed consolidation of the Dominion Steel Co. with the Nova Scotia Steel & Coal Co., or with respect to the recommendations of the expert British engineers involving an outlay of approximately $25,000,000 on the plants and properties in Great Britain and elsewhere. In attendance at the meeting were Sir Newton Moore, W. Grant Morden and Benjamin Talbot, members of the London advisory committee of the corporation, out of town directors included Sir Henry Pellatt, Sir William Mackenzie and J. H. Plummer, of Toronto, and Hector McInnes, of Halifax, N. S. Although no official announcement was made following the meeting, it is understood that a full discussion of both the subjects mentioned was indulged in, with a lack of unanimity of opinion developing in each. As to the proposed deal with the Nova Scotia Steel & Coal Co., the matter, it is believed, is still one of terms, there being some sharp divergence in the views expressed as to the basis on which a consolidation might be effected. For the present it would seem the deal is still in the negotiation stage, but pour-parlers will be continued in the hope of arriving at a satisfactory settlement of the outstanding difficulties.

The proposal to embark upon a policy of extensions and development along the lines recommended by the British engineers who recently made a comprehensive survey of the properties of the company, and who, it is stated, also inspected the plant and holdings of the Nova Scotia Steel & Coal Co., was fully discussed at the meeting. It is believed, however, that owing to the existing monetary conditions and with the view to further considering the recommendations, no immediate action will be taken by the board in this respect. There was no change made in the executive of the company, though it is understood President Mark Workman again expressed a desire to retire from the presidency in order to devote himself to more personal affairs. He has, however, agreed to remain in the office of president for several months longer.

Magnesite Bill Reported

WASHINGTON, March 9.—After threatening to keep the bill providing protective tariff duties on imports of magnesite in committee without further action, the Senate Finance Committee has finally reported the measure to the Senate. This step was taken after Senator Poindexter, of Washington, where the magnesite industry centers, threatened to block action on the dye embargo bill unless the magnesite bill, which has already been passed by the House, was given a chance of passage in the Senate.

According to the present plans of the Senate leaders, the magnesite bill will be called up for action after the dye bill is out of the way. Its passage is somewhat doubtful in view of the very narrow margin of the Republican control of the Senate, and the fact that Pittsburgh interests, which have a large investment in magnesite in Austria from which they supply their product to the steel industry, are opposed to the legislation.

Senator Curtis, of Kansas, in reporting the bill to the Senate from the Finance Committee, described the situation existing in the magnesite industry.

Will Resume Construction at Clairton By-product Coke Plant

The Carnegie Steel Co., Pittsburgh, is getting ready to build the final battery of ovens at its Koppers by-product coke plant at Clairton, Pa. Just before the war, the company started to construct 1280 ovens, but the war interrupted the program after 768 had been built. Now it is planned to go on with the work. The building of the additional ovens will require also the construction of about 600 new houses for the company's workingmen.

Industrial Relations

Two Experiences

Short Talks on Vital Questions by One of Experience

This is the sixth and last of a series of articles on Industrial Relations by Thomas Stanion, director of safety, Aluminum Manufacturers, Inc., Cleveland, formerly the Aluminum Castings Co. It tells what has been accomplished by two large companies in dealing with their employees in a progressive manner.

"The proof of the pudding is in the eating." Nothing short of a cold-blooded business basis should be used in determining the value of Industrial Relations efforts, for, remember, this is simply one link in the chain representing the whole business structure. No definite progress toward industrial peace will be made unless, when cast up in the ledger, the result is on the profit side. Not only should there be a financial benefit for the company involved, but all its workers should have fared better than heretofore. What helps the one, to be of real value, cannot fail to benefit the other. Two actual experiences will be given to illustrate the results that can follow Industrial Relations efforts when developed according to the programs of the particular companies involved. Both companies are large as corporations are rated these days.

During the closing days of the war, one corporation realized that "collective bargaining," as it is commonly termed, was coming and that a wise policy would be to get ready for such a situation. Using the best thought available in its own staff, a plan for bargaining with its employees was drawn but not put into action. In the study necessary to work out this plan, as it may be called, the officers realized that far more than a mere means of settling wages, hours, conditions and disputes with their men was involved and that they were really undertaking the whole man problem in their shops, making possible an educational work all along the line from the executive force to the sweepers through which the good will at the top could be spread throughout the whole organization. Furthermore, the officers were sincere and wanted a plan that could actually settle vital differences; at the same time a comprehensive plan that would cover the wide interests of their corporation and yet simple enough to be understood by the workers.

To this end the Executive Committee, through a well chosen representative from the organization, made a careful study of the many undertakings of this sort throughout the country, delving into the failures as well as the successes. From the knowledge thus gained a plan was drawn which seemed to suit the company's conditions and submitted to the Executive Committee where it was carefully criticised and its weaknesses pointed out. Then more study in the field and the plan redrafted and re-submitted with better success; and thus the plan was developed—the best minds in the corporation helping with their experience to mold a thoroughly practical, workable plan, keeping in mind its relation to other phases of the business. As it neared its final form, the main points were explained to operating executives so that they could gradually come to understand the objects of the plan and how it would function. They in turn passed the information along to their subordinates so that when it was time "to sell" the plan to the entire executive and supervising force, it had a field of good prospects. Great care was taken in the manner through which the plan was presented to the worker, for its final acceptance or rejection was in his hands.

This company had long interested itself in various activities tending to surround the workers with wholesome conditions and to give them some contacts with the employer aside from production. The employees had entered into these and found the company sincere. When this new step forward was launched, they were ready to accept it in good faith and their votes, cast in a secret ballot, showed a majority favorable in every department. The plan immediately began to function and very soon questions of wages and hours came up for decision. The employee and employer representatives were of equal numbers and voting strength. That both sides entered into the discussions fair-minded and open to conviction is evident by these mutually satisfactory results—decisions made by this group alone, unaided by any methods of appeal or arbitration: (a) Many conditions surrounding work improved; (b) wages increased; (c) hours shortened; (d) impending strikes avoided without any change in wages, hours or conditions; (e) strikes settled without granting the demands; (f) safety work and other employee activities invigorated; (g) entire relation between employee and employer changed. The whole experience thus far has been highly satisfactory. The management approached the men open-minded and placed all the cards on the table, face up. The workers have played their part as men, realizing the extent to which their share in management should go. They have not asked to be placed on the board of directors, nor demanded a share of profits. Both company and men are looking forward confidently to a future of ever-increasing mutual benefit from this effort assured, that as new problems arise they will be able to keep pace with them.

The second company under consideration has been fortunate in a leadership of aggressive men. In years past, it has had a reputation as a "good place to work" and has set the pace in its community, although strikes and other labor difficulties have occurred at various times. During the war, the company had a large share of war contracts that required enlargements and close attention from the management; thus unintentionally the man-problems in the shops were given less thought than they deserved. Other things—larger shops, more machinery, new systems to expedite production, other lines of manufacture and such affairs—seemed to crowd the days full and the officers did not appreciate the forces active in the world of the workers which were hurrying the day when they, the workers, would occupy a new place in shop management where they could rightly help to decide the questions of fair wages, hours, and conditions. True the officers were not blind to happenings of the day and appreciated that labor was "getting obstreperous and kicking over the traces," but quieted their fears by the assurance that conditions would change presently and that jobs would be scarce.

Conditions didn't change and one day the company realized that something must be done. It had in the past carried on various activities for the employees and had done some safety work. But these had not been co-ordinated nor conducted along the real business line found in some other

cases, and hence formed no background on which to build a large structure of mutual understanding with the men. On the surface, it seemed the unrest was caused by a feeling among the workers that the company should give them a larger share in its financial gains. It did not seem wise to grant a wage increase, so a scheme of profit-sharing was decided upon. Announcement of this fact was made and given publicity, but many of its important details were lacking. The officers expected to work these out at a later date. The workers, however, made their own interpretation and naturally went too far in their expectation. In due time the first distribution of profit was made, in itself a goodly sum, but when divided among a large number, it was not at all what the workers expected. Its effect was far from what the company had hoped would result. The unrest continued and a few weeks later a serious labor disturbance resulted.

The hopeful part of this experience is that the company has not lost faith in industrial relations, but rather has been convinced of the good a definite program of this work can accomplish. The distribution of profits is to continue under the original plan. The officers have realized that they have given too little consideration to the man-problem in their shops, and have dignified it by creating an Industrial Relations Department in their organization where they have correlated the many employee activities. A definite plan affording the employee a voice in deciding the proper shop questions was put into action and has made real progress. It now seems that they are on the right track and that the road ahead is clear.

The experiences of these two companies are typical and demonstrate clearly one fact: The unrest of the workers to-day is not all a question of wages, or hours, but rather founded on conditions which money alone cannot rectify, for it has to do with the happiness of the worker and his feeling of a share in control of shop problems vital to him.

MOLYBDENUM IN STEEL

Rate in High Speed Steel—Substitute for Nickel —Supplies of the Ore

In a communication to the *Mining and Scientific Press* of Feb. 7, Alan Kissock, president Steel Alloys Co., Los Angeles, Cal., discusses the article by W. E. Simpson on "Molybdenum and Molybdenum Steel," published in that journal and abstracted in THE IRON AGE, Jan. 22. He says in part as follows:

"In every article that attempts to set forth the valuable properties of molybdenum steel a criticism usually follows in short order. Those in favor of molybdenum are sometimes over-optimistic and resort to superlative terms, which are barely justified, but at the same time most of the criticisms are based on ignorance of recent developments. Mr. Simpson's article is one of the best that has come to my attention. It sets forth truly the real benefits to be derived by the addition of molybdenum to steel and correctly states that it is a valuable auxiliary.

"As Mr. Simpson mentions, there are some optimists who believe that molybdenum might replace nickel. Although not quite so enthusiastic, I do know, from results secured and because this country has no extensive deposits of nickel, that molybdenum might at some time serve a strategic purpose in this connection.

In High Speed Steel

"Molybdenum has often been advocated for use in tool steels. Although believing that some day its control and use for this purpose may become better appreciated, I have never considered it as a competitor of tungsten. Its value is far more extensive. There is one point, however, in Mr. Simpson's reference to the use of molybdenum in tool steels that apparently is quite widespread and which I believe to be in error. It is that the highly volatile nature of molybdenum causes such steels to change in chemical composition at each reheating. The metal molybdenum itself is not volatile except at exceedingly high temperatures. Molybdenum does oxidize, however, at about 600 deg. C. and the trioxide so formed is volatile at low temperatures.

"In recent tests molybdenum has been introduced into the open-hearth bath in the early stages of melting and has remained at a constant content therein even though it was subjected for 15 hr. not only to the ordinarily severe oxidization characteristic of this operation, but also to oreing down in order to decrease the carbon content of the steel. From this and other confirmatory tests it has been proved that molybdenum has less affinity for oxygen than either iron or carbon. Although the percentage contained in tool steels might effect a different result, it is doubtful whether the molybdenum would appreciably oxidize and then volatilize at each reheating, at least not in any greater proportion than the iron itself may oxidize.

Supplies and Price

"The only other point to which I take exception is the possible production. Mr. Simpson makes a comparison with nickel, and says, 'As to supply, no molybdenite property at present known can offer, say, 50 tons per month, whereas the nickel-bearing ore bodies are so large that during the war no difficulty was experienced in extracting from one shaft alone a total of 5000 tons of ore in one day.' I differ with him, for I have in mind one molybdenite property that is equipped to treat 1000 tons of ore per day and produce therefrom, say, 10 tons of 60 per cent MoS_2 concentrate per day, or 300 tons of such concentrate per month.

"Although possibly this is the largest single producer, there are several others, both in this country and in Canada, equipped to bring the total production to fully 500 tons of such concentrate per month, and there are sufficient other properties that could be equipped, if the need arose, to increase this considerably. I do not know the nickel content of the 5000 tons per day mined, but since a much smaller percentage of molybdenum is used in steel, as compared to nickel, I venture to say that, expressed in tons of steel ingots (leaving out the possibility of its being a competitor as far as its properties are concerned), sufficient molybdenum could easily be produced to compare with the nickel production.

Future of Molybdenum

"My purpose is not that of criticism; my only object is to correct a common misbelief. The British steel expert told Mr. Simpson: 'The future of molybdenum depends on two factors, namely, assurance of supply and price;' it is indeed true that these two factors are most important as regards the development of molybdenum steel. Unfortunately, heretofore, many small and sanguine mine owners and producers have entered into contracts to deliver and have failed to live up to their agreements. This has led to the opinion that a reliable supply of molybdenum could not be depended upon, and has offered a serious drawback to progress. My only purpose then is to state that when demand does arise there are responsible interests now able to assure an ample supply.

"The matter of price is of almost equal importance to supply, but further recent and proved improvements, as for instance, the use of calcium molybdate in the place of the ferroalloy as an addition-agent to any steel bath, are such that molybdenum may be offered at a figure that cannot fail to demand recognition. I fully agree with Mr. Simpson that molybdenum will shortly fill an important place in the ever-increasing alloy steel industry."

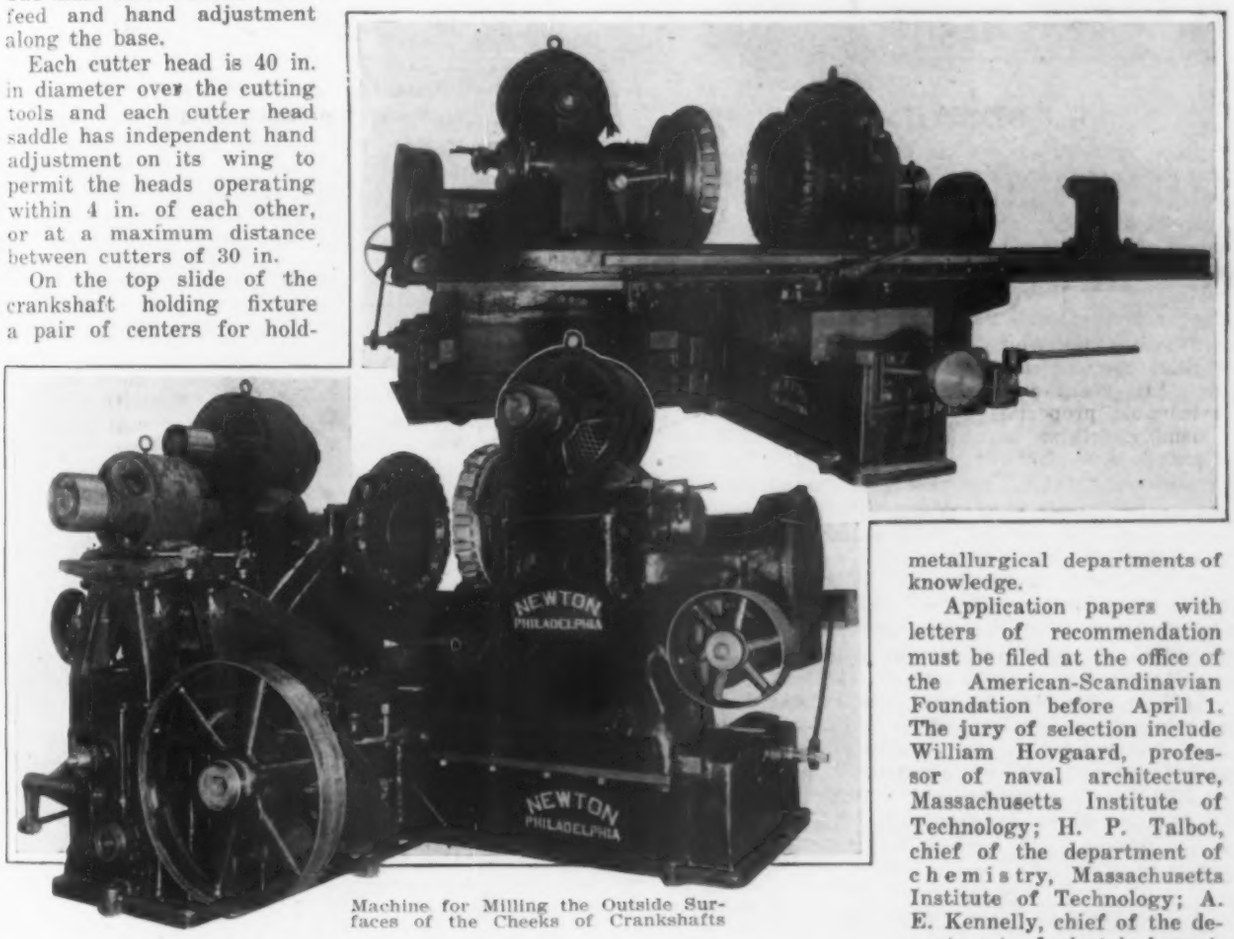
Crankshaft Cheek Milling Machine

Machining the outside surfaces of the cheeks of crankshafts upon a lathe is an expensive operation, due to the fact that there is lost motion and operating expense during the time the crankshaft revolves in the lathe and no cutting is done. To eliminate this loss the Newton Machine Tool Works, Inc., Philadelphia, have recently developed the crankshaft cheek milling machine shown in the accompanying illustration.

The machine has a work table 72 in. long and 32 in. wide, and on this work table there is fitted the crankshaft holding fixture, the top slide of which is adjustable crosswise by a rack and hand-operated pinion. This table has forward as well as reverse fast power traverse, in addition to hand adjustment. The adjustment of the table is by a revolving screw and a stationary nut. There are six changes of gear feed to the table, obtained through sliding sleeves on which the gears are mounted in an oil-tight box, and these sleeves are controlled by latch levers outside the cover. The main table has 30 in. of feed and hand adjustment along the base.

Each cutter head is 40 in. in diameter over the cutting tools and each cutter head saddle has independent hand adjustment on its wing to permit the heads operating within 4 in. of each other, or at a maximum distance between cutters of 30 in.

On the top slide of the crankshaft holding fixture a pair of centers for holding the crankshaft is fitted. The center on the right-hand side of the machine occupies a rigid position and the center on the left-hand side has hand adjustment to permit of its insertion into the centers of the crankshafts. Both centers are adjustable upon the top slide, the maximum distance between centers being 15 ft. The distance from the top of the main slide to the center of the center in which the crankshaft is to be placed is 11 in. Suitable hand-operated arch clamps are provided for clamping the cranks while being cut.



Machine for Milling the Outside Surfaces of the Cheeks of Crankshafts

Each cutter head is a solid steel casting with slots for the tools machined from the solid and the teeth of the driving gear cut from the solid in the rear of the head.

The width of each wing on which the spindle saddle will be mounted is 56 in., and the actual length of each spindle saddle bearing on the wing is 50 in. The height of each wing above the floor is 18 in. and the height of the main base on which the main table is supported is 28 in. Cutter heads are driven by individual motor, through internal gears.

The table is driven by motor of interlocking control type, so that in the operation of stopping the table the motor will stop first and in the operation of starting the two driving motors for cutter heads will start first.

The accompanying illustrations appeared in error with a description of a Newton cold saw for cutting 29-in. stocks, in THE IRON AGE, issue of Feb 26, page 612.

Scandinavian-American Technical Fellowships

Traveling fellowships for technological research and humanistic study in Scandinavian universities have been established by the American-Scandinavian Foundation, 25 West Forty-fifth Street, New York. Twenty fellowships for one year, each with a stipend of at least $1000, and in some cases $1200, are to be awarded in May to students of American birth. Five students will be sent to Denmark, five to Norway, and 10 to Sweden. Study may be pursued in chemistry, physics, hydro-electrical engineering and metallurgy, as well as non-metallurgical departments of knowledge.

Application papers with letters of recommendation must be filed at the office of the American-Scandinavian Foundation before April 1. The jury of selection include William Hovgaard, professor of naval architecture, Massachusetts Institute of Technology; H. P. Talbot, chief of the department of chemistry, Massachusetts Institute of Technology; A. E. Kennelly, chief of the department of electrical engineering at Harvard University; William Campbell of the department of metallurgy, Columbia University, and Henry Goddard Leach, secretary of the foundation.

Successful candidates will be notified about May 1 and are expected to sail from New York in early summer, so that they may familiarize themselves with the language and life of the people.

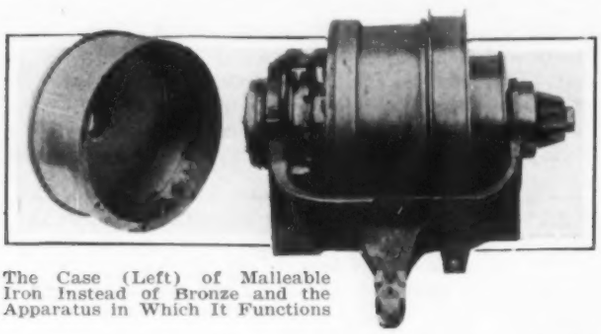
These fellowships are financed on the one side by 20 American individuals and corporations and on the other side by 20 Scandinavians. Among the American guarantors to the Swedish exchange is the SKF Ball Bearing Co. Svante Arrehenius, founder of the theory of electrolytic dissociation, and Hjalmar Lundbohm, director of operations on the great iron mountains at Kiruna, are among the eminent scientists in these countries under whom these studies may be pursued.

A department for the sale of electric welding machines, including spot welding, butt welding and seam welding machines, is to be opened by Aux Forges de Vulcain, 3 Rue St. Denis, Paris, France, an organization which represents a number of American tool manufacturers and makers of small precision tools.

Malleable Castings Replace Bronze in Specially Designed Transmission

Captive observation balloons, even in the absence of any risk from enemy attack, operate with considerable danger to the occupants and require instant release and recovery by the mechanician who operates the specially designed apparatus at the ground end. Through the courtesy of the American Malleable Castings Association may be shown that part of the equipment where 100 per cent efficiency is required for the protection of the lives of the observers.

This is the transmission which is connected with



The Case (Left) of Malleable Iron Instead of Bronze and the Apparatus in Which It Functions

the windlass through the bevel pinion meshing in the bevel gear which is attached to the winding drum. This transmission has three brakes, one of which, composed of a steel band, lined with copper segments, operates on the surface of the large case or drum. This latter is especially designed not only to function with the brake but to house the transmission. The gears inside this case, which is shown separately in the illustration, operate in oil and at such high speed that tremendous pressure is exerted against the sides of the case.

The case must not only be entirely free from the slightest flaw and of great tensile strength, but its texture must permit such accurate machining that the escape of the slightest amount of oil is prevented in order to insure the efficient operation of the brake. In the original French design this case was made of bronze, but in this country it was possible to secure a malleable casting meeting all the requirements of the Government's specifications and in some respects proving much superior to any other material.

For obvious reasons the identity of the foundry manufacturing these parts cannot be stated, except to say that the maker is a certified member of the American Malleable Castings Association and licensed to make "certified malleable castings."

The separate casting after machining weighs 40½ lb. and has an outside diameter of 12⅝ in. and a wall ½ in. thick. Total depth at hub 6½ in., and at outer rim 5 in.

Iron and Steel Making in India

"The United States need have no fear of competition in iron and steel making from India and the Orient as far as labor is concerned," Barton R. Shover, consulting engineer of Pittsburgh, informed members of the Youngstown District Engineers' Club whom he addressed Feb. 24. With wages of steel mill laborers nine cents a day in India and $1.57 a day in America in 1916, the cost of production was not greater here than there, he states. "The Indian laborer considers he is well paid at nine cents a day and he is not mistaken," says Mr. Shover. "It is necessary to keep constant watch on him if you expect him to work. If you don't watch him he'll loaf, and if you watch him he'll loaf anyhow. Three thousand men at the Ohio Works of the Carnegie Steel Co. used to produce 3000 tons of steel a day. That was a production of one ton a man a day. In my plant in India, 10,000 men produced 10,000 tons a month. That was a production of one ton a man a month.

"The competition that the United States will need take note of in peace times will come from the favorable location of the Tata Iron & Steel Co., only 39 miles from great and almost inexhaustible iron ore mines, and concessions made by the Indian Government and privately owned railroads to steel companies. Just before the war, the Tata Iron & Steel Co., which in 1916 produced pig iron at a cost of $6.25 at the furnace, delivered a shipload to San Francisco, underselling American manufacturers. Railroads in India are either owned by the Government or privately owned and under Government supervision. The steel companies get special rates, which with the low cost of ocean freight transportation, may bring about competition from the Orient in pig iron, without any danger whatever from rivalry in the finished product."

Mr. Shover designed and supervised construction of the Tata Iron & Steel Co. plant, which he supervised for two years as general manager. He was previously connected with the Carnegie Steel Co. at Youngstown. Since his return from India, he has been engaged by the Dominion Iron & Steel Co., Nova Scotia, and is now consulting engineer of the Electric Alloy Steel Co., Youngstown, whose plant he is designing.

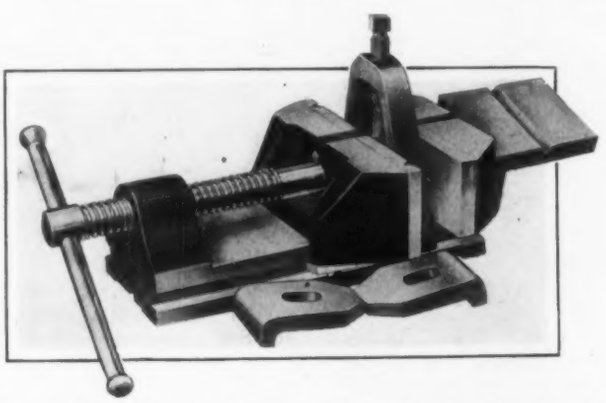
Excessive humidity at certain seasons of the year is a deterrent against large production in India, Mr. Shover said.

Vise for Manifold Uses

A vise with V blocks and angle plate and stated to be especially adapted for use on a drill press, milling machine, planer, etc., is being manufactured by the Germanow-Simon Machine Works, Rochester, N. Y.

The V's are cut across the top of the jaws, and a removable steel clamp for holding the work in the V's

Combination Vise Having V Blocks, Angle Plate and Special Clamp. The small half-tones show various applications of the vise



is provided, thus to do away with V blocks, straps and bolts. The V's cut on the face of the sliding jaw are emphasized as handy in setting up duplicate parts, which is difficult with inserting blocks. The steel plates on the face of the jaws are case-hardened so that the V's may not be marred. The jaws extend 1½ in. on each side of the base, emphasized as an important feature for work which cannot be held otherwise but in overhanging jaws. The adjustable angle plate can be readily set to any degree and is held in position by tightening one nut.

The base is one solid casting and has two ⅝ in. slots cut in the bottom. The sliding jaw is operated by a square thread screw set in the center, thus to keep the jaws always square by preventing wear on the bearings and to give the vise additional gripping power. Each vise is provided with two special straps for fastening it to the table.

The Hartford Iron Works, East Hartford, Conn., architectural and ornamental iron work, whose plant recently was destroyed by fire, is doing business again.

Heavier British Steel Exports in January

British steel exports in January this year, excluding iron ore and including scrap, were 261,248 gross tons. This exceeds the outgo for any month in 1919. The January exports in 1919 were 171,111 tons. The present rate, however, is far below that of 1913, when for January of that year they were 446,672 tons.

Iron and steel imports in January this year were 79,024 tons, which is considerably above the amount for 1919. This was exceeded only once in 1919, when the imports were 87,892 tons in October. In January, 1919, the imports were 52,588 tons and in January, 1913, they were 234,285 tons.

The following summary gives the relative exports and imports for January, 1913, 1919 and 1920, and the amount per month for 1913 and 1919 in gross tons:

			Exports		Imports
Pig Iron	78,771	21,503	85,718	30,574	42,793
January, 1919			171,111		52,588
January, 1920			261,248		79,024
Average per month, 1913			420,757		195,264
Average per month, 1919			204,516		51,557

The trend of some of the principal exports is shown by the following data in gross tons:

	Av. Per month, 1913	Av. Per month, 1919	January, 1913	January, 1919	January, 1920
Pig iron	78,771	21,503	85,718	30,574	42,793
Steel rails	41,676	10,435	35,523	2,858	6,707
Steel plates	11,162	19,962	11,588	28,155	13,678
Steel bars	20,921	20,787	22,229	17,615	25,419
Galvanized sheets	63,506	15,508	63,525	2,195	35,162
Tin plates	41,208	24,147	46,260	19,135	31,591
Black sheets	5,679	11,109	6,453	21,064	11,597

The principal export gains in January, 1920, over January, 1919, and the 1919 monthly average have been in pig iron, steel bars, galvanized sheets, and tin plates.

Iron ore imports show but little expansion. Last January they were 11,654 tons against 10,850 in January, 1919, and 28,782 tons in January, 1913. The average per month in 1919 was 10,653 tons.

Pig iron imports have increased over those in 1913. Last January they were 21,621 tons against 18,187 tons in January, 1913. The average per month in 1919 was 13,623 tons and in 1913 they were 18,059 tons per month.

Manganese ore imports in January, 1920, were 24,933 tons. These compare with 33,216 tons in January, 1919, and with 63,685 tons in January, 1913. The average per month in 1913 was 50,098 tons and in 1919 it was 22,150 tons.

New Company in Special Machinery Manufacturing

The Dieffenbach-Westendorf Mfg. Co., which has taken over the original plant of the Black & Decker Mfg. Co., Baltimore, located at 105 South Calvert Street, is composed principally of the older members of the city plant organization. O. W. Dieffenbach, president, was formerly manager of the Baltimore plant, and William Westendorf, vice-president and general manager, was superintendent there. George M. Kimberly, treasurer, has been treasurer of the Black & Decker company for a number of years, which position he still holds. The secretary of the new company is John Sonnenleiter, foreman of the milling machine department.

The directors of the Dieffenbach-Westendorf Mfg. Co. are O. W. Dieffenbach, William Westendorf, George M. Kimberly, Albert Fankhanel, John Sonnenleiter, Alonzo G. Decker and S. Duncan Black. Numbered among the stockholders are practically all of the older employees of the plant.

The new company starts off under auspicious circumstances as the plant is completely equipped for the manufacture of special machinery and now has enough business booked to keep it busy for a long time. It is at present operating two shifts.

The Black & Decker Mfg. Co. will discontinue the special machinery business and devote its energies to an endeavor to keep up with the demand for lectroflaters, portable electric drills, and electric valve grinders, and a new product, the loadometer, a device for indicating on the dash the amount of load or overload a truck is carrying. Also a road type loadometer for the use of state police in detecting violators of the road overloading laws.

The Dieffenbach-Westendorf Mfg. Co. is now devoting quite a large portion of its capacity to the overflow from the Black & Decker plant, which although recently more than doubled in size, is already beginning to be crowded.

Swedish Steel Industry in 1919

The output of iron and steel in Sweden in 1919, according to the statistics of the Swedish Iron & Steel Association, was as follows, compared with other data in metric tons:

	1919	1918
Pig iron	497,400	674,900
Puddled iron	62,300	92,000
Bessemer steel ingots	56,900	66,500
Open-hearth steel ingots	412,400	458,300
Rolled and forged iron and steel	316,900	361,400

The average pig-iron output during the eight years, 1912 to 1919, was 679,800 tons. The 1917 output was 824,000 tons. Active blast furnaces in the last quarter of 1919 numbered 49 against 83 at the end of 1918. Open-hearth furnaces for the same period were 42 and 47 respectively.

Exports and imports in 1919 compared with 1918 were as follows in metric tons:

	Exports		Imports	
	1919	1918	1919	1918
Iron ore	2,419,000	4,486,000	.....	.....
Pig iron	81,262	180,113	26,639	16,783
Iron and steel	143,233	183,753	.....	.....
Scrap	.....	.....	51,608	33,791
Structural steel	.....	.....	22,079	30,882
Plates and sheets	.....	.....	24,517	16,412

Steel Production in Newcastle, Australia

According to a report of the Broken Hill Proprietary Co. covering the operations for the four weeks ended Dec. 10, 1919, there are at present 157 coke ovens in operation, 29 new ones having been started on Dec. 5. The coke-oven plant as designed provides for a total of 195 ovens. There were 18,360 tons of coke, 211,170 gal. of tar, and 301 tons of sulphate of ammonia produced during the four weeks, a marked increase over the production earlier in the year.

The blast furnaces were worked regularly during the four weeks and produced a total of 22,275 tons of pig iron. At the open-hearth furnaces 19,242 tons of steel were turned out. The blooming mill produced 16,746 tons of steel blooms and the finishing mill produced 9070 tons of steel rails. The 18-in. mill produced 6018 tons of structural shapes; the 12-in. mill, 1469 tons, and the 8-in. mill 554 tons. There are three shifts now working at the rod mill, which turned out during the period 2463 tons.

Stanley Plants Will Probably Consolidate

Plans are on foot for the consolidation of the Stanley Rule & Level Co. and the Stanley Works, New Britain, Conn., manufacturers of tools and hardware, by the sale of the former company to the Stanley Works. The directors of both companies have sanctioned the merger, and the stockholders will be asked to ratify the sale at an early date. The sale price agreed upon is approximately $3,000,000.

The Stanley Rule & Level Co. has $2,000,000 stock outstanding, and owns besides its plant at New Britain, factories at Bridgeport and Southington, Conn.; South Shaftsbury, Vt.; Newark, N. J., and Quebec, Canada. The Stanley Works is capitalized for $2,500,000, and maintains plants at Niles, Ohio; Bridgewater, Mass.; Hamilton, Ont., and at Kobe, Japan.

A drop in per share earnings from $40.64 in 1918 to $8.56 in 1919 is revealed in the annual report of the Taylor-Wharton Iron & Steel Co. Net earnings last year were $521,161, a falling off from the preceding year of $1,116,660. Surplus after all charges was $41,000.

NEW HEAT TREATING METHOD

Critical Point of Steel Shown as Hump in Curve by Autographic Recorder

A new method for the heat treatment of steel known as the hump method, has recently been introduced by the Leeds & Northrup Co., Philadelphia. This method, as covered by U. S. patent No. 1,188,128, utilizes the outward manifestation of changes in internal structure which take place when steel is heated past the so-called critical or transformation point to indicate when the work should be withdrawn from the furnace. In using this method, the temperature of the furnace, and therefore of the work, is raised at a uniform rate until the transformation point of the steel is reached. At this time there will be a marked decrease in the rate of temperature rise. This change in the rate of rise is made visible to the operator by an autographic recorder connected to a thermocouple placed close to or in contact with the work. The effect is shown by a bend or hump in the curve as at *C*.

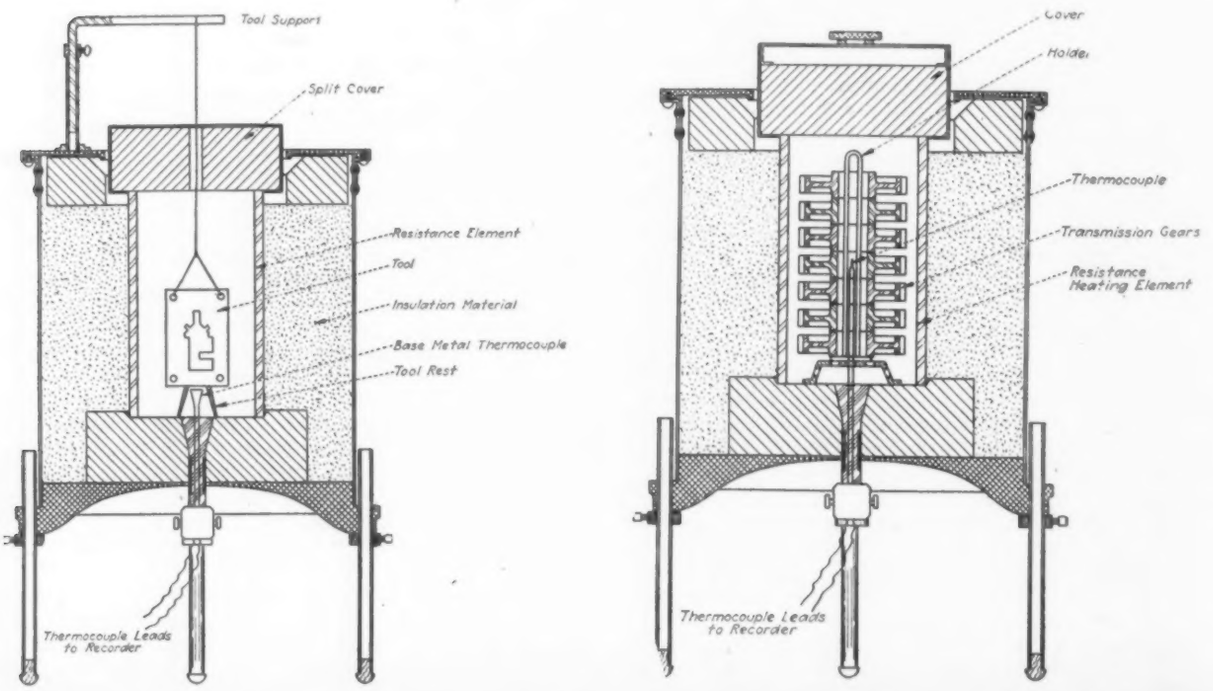
It is explained that the user of the hump method need not concern himself about the absolute accuracy of his pyrometer, nor bother with independent transformation point determinations, also it is not necessary that the temperature indicated by the thermocouple should be the correct temperature of the work, for so long as the recorder connected to the thermocouple shows clearly the pause in temperature rise, the moment at which transformation occurs is definitely known. Having learned by trial just how many minutes should elapse after the beginning or end of the transformation before the work is removed from the furnace, there is no uncertainty about the results of hardening.

Uniform, standardized conditions and a control of the rate of heating the work are essential to the hump method of heat treatment. A small furnace for heat treating tools, dies, etc., is shown in one of the accompanying illustrations. The heating element consists of a vertical, cylindrical resistor, surrounded by insulating material in a sheet-iron jacket. The resistor rests upon a refractory block, which is supported by a cast-iron bottom plate. The heating chamber is closed at the top by a refractory cover, while a cast-iron top-plate confines the loose insulating material, filling the space between resistor and jacket. An iron-constant in the thermocouple of bare No. 8 gage wire projects upward from the center of the bottom refractory block.

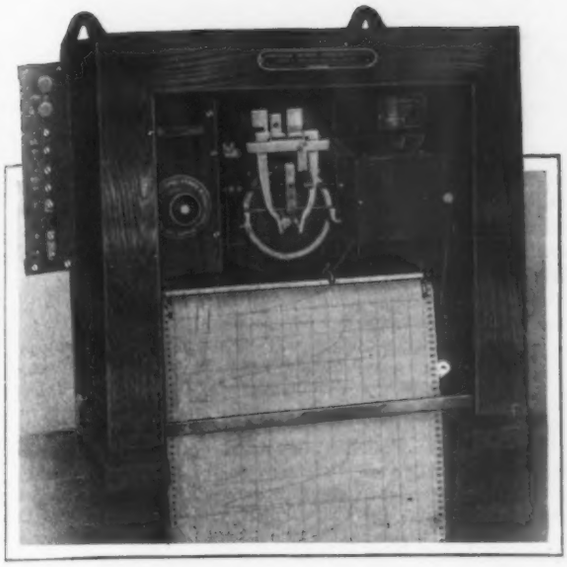
By means of a small wire attached to a tool support on the top plate of the furnace, the work to be treated can be suspended in close proximity to, or touching, the end of the thermocouple. In production furnaces other methods of supporting the work are used. For example, in the furnace shown designed for heat treatment of automobile transmission gears, the work is placed upon holders before insertion in the furnace. Covers placed on the furnace completely close in the heating chamber, preventing renewal of the atmosphere, and the work is thus protected against oxidation and scaling.

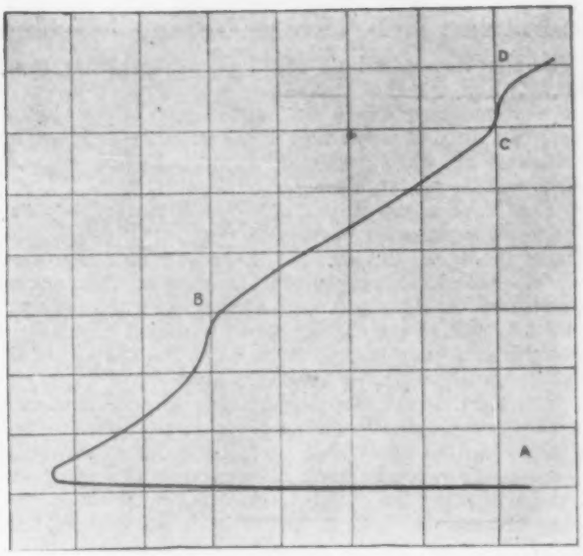
At the moment when the work is introduced into the furnace, the temperature of the latter drops rapidly due to the fact that the heat storage capacity of the furnace walls is small compared with that of the charge, the current through the heating element or resistor being shut off during this time. The temperature then rises slowly to *B*, where it is stationary, the thermocouple, furnace walls and all parts, small and large, of the charge having reached approximately the same temperature. The switch is then closed, the input being so regulated that the temperature rises at the desired rate. The fact that the work and furnace start from the same temperature at *B*, far below the critical point, coupled with a proper arrangement of the heating element with respect to the charge, it is stated, insures that all parts of the work will go through the critical point at the same time. This is desirable in order to avoid stresses and distortion that would follow from unequal expansion or contraction if different parts of the work passed through the transformation point at different times.

By using the hump method, it is explained, errors due to inaccuracy of pyrometers, non-uniform temperature in the furnace, failure of the work to reach the furnace temperature, or incorrect information regarding the transformation temperature, are avoided, and the steel is not injured by overheating or by holding it at a high temperature for too long a time. Each piece of work carried the same distance beyond the reference point *C* or *D* will show the same internal structure. This is true whether or not the temperature represented at the point *C* on the chart is correct, and whether or not it is the actual temperature of the steel at that moment. The important fact is that the chart tells the attendant when the steel is going through the transformation, from which he may know that quenching after a certain interval will secure the desired physical



An Electric Furnace Used for Heat Treatment of Tools, Dies, Etc., by the Hump Method Is Shown in the Upper Left Hand Line Drawing. The other drawing shows the furnace used in the commercial production of automobile gears





Curve-drawing Potentiometer Pyrometer Used in Connection with the Hump Method of Heat Treatment. The chart shows the hump *C-D* due to passing of steel through the transformation point

qualities. The chart remains as a record of just how each individual lot of steel was treated, and can be referred to in connection with properties developed in physical tests of that steel.

It is found that the rate of temperature increase has a marked influence upon the properties exhibited by the steel after quenching. The resistance furnace is emphasized as being admirably adapted for controlling the rate of temperature rise, since the rate of energy input is regulated by reference to an ammeter supplied as part of the furnace equipment. The potentiometer pyrometer shown in one of the accompanying illustrations is explained as being peculiarly suited for carrying out the hump method of heat treatment, as it is sensitive to small changes in thermocouple e.m.f., and exhibits changes in rate of temperature rise upon a magnified scale.

The hump method of heat treatment is controlled by the Leeds & Northrup Co. of Philadelphia, which company also manufactures the electric furnaces and curve-drawing pyrometers used in carrying out the process.

Self-Scaling Evaporator

The Reilly evaporator, submerged type, for the purification by evaporation of boiler feed water and manufactured for a number of years for marine purposes, is now being marketed for stationary power plant purposes by the Griscom-Russell Co., 90 West Street, New York. The purification is accomplished in a similar manner to the ship-board procedure with the exception that the refinements of operation are greater and plants are so arranged, it is explained, that practically all of the heat used in the evaporation of the water by the use of steam is returned to the system.

In the actual operation, high pressure steam is supplied to the coils of the evaporator, and in condensing in these coils, evaporates the body of water in the shell surrounding the coils. This purified vapor is in turn condensed in a condenser and is ready for boiler feed. The coil used in the evaporator is stated to be self-scaling.

Hard Task of the Railroads

BALTIMORE, March 9.—The Baltimore & Ohio and Western Maryland railroads, the two trunk line carriers having central offices in Baltimore, have no immediate plans for expenditure of money on terminals. These roads will participate with the other carriers of the country in the plans, fostered by the Government, for the supplying of new equipment, through the issue shortly of $300,000 000 in railroad equipment notes. Arrangements for this financing are in the hands of the Guaranty Trust Co., New York, and it is expected they will be announced within a week or ten days.

Concerning the unified terminal plans of the Eastern roads President Daniel Willard of the B. & O., says it will be the policy of his road to co-operate in every way with other systems wherever it is found to be for the best interest of the railroads and the public. In regard to the continued use by the B. & O. of the expensive Pennsylvania Railroad terminals in New York Mr. Willard stated no final conclusions had been reached by the two roads in the matter.

"The hardest task which the railroad executives face," he said, "is the restoration of their properties to the physical conditions which existed prior to government ownership. Several months may elapse before they will be satisfied with their handiwork. In the task that awaits them they will be hampered by lack of resources, lack of immediate credit and high cost of labor and materials. The public must therefore be prepared to be tolerant until the railroad managers bring order out of chaos and establish discipline on a firmer basis."

Terms of Payment for Rolling Stock

WASHINGTON, March 9.—After discussion extending over several months, an agreement has finally been reached between the railroads and the Railroad Administration relative to the disposition and payment for the 100,000 freight cars and 1930 locomotives which were bought by the Government during the period of Federal control. The equipment was allocated to various roads, and in return the Railroad Administration has accepted part cash, where roads were able to pay cash, and equipment trust obligations totalling $360,000,000 to be paid in 15 annual installments, and bearing 6 per cent interest.

Equipment trust obligations have been accepted from 74 railroad companies. These equipment trust obligations which are the obligations of the individual carriers, aggregate about $360,000,000, and are in such form as to enable the Government, should it so desire, to carry out the plan for the creation of a national equipment corporation that would issue its own obligations through the sale of such obligations the Government reimbursed. If it should be deemed desirable, however, for the Government to sell the individual obligations of the carriers, it is in a position to do so; if it prefers it can hold them, receiving the annual payments.

The condition of the money market in the past several months has not been such as to warrant the carrying through of the national equipment plan. Just the method that the Government may pursue in the sale of these obligations, should it decide not to carry the indebtedness itself, will of necessity be dependent on market conditions.

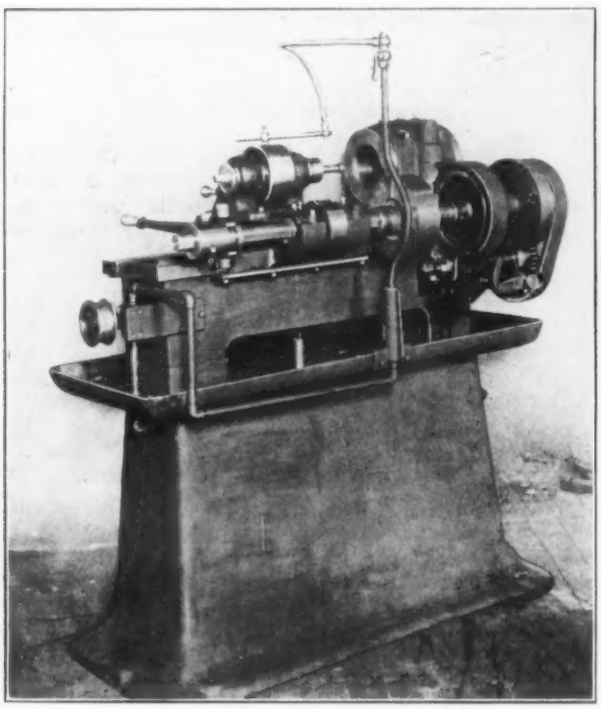
Automatic Hob Thread Milling Machine

A hob thread milling machine, designed for rapid internal and external threading, is a recent product of the Automatic Machine Co., Bridgeport, Conn. The particular field of operation is short, taper or straight, threading or milling located at or near the ends of parts 6 in. or less in diameter.

The machine is of the multiple cutter type which completes a threaded portion in practically one revolution of the work, and because of the automatic features, one operator can tend several machines. The setting for size on each piece is unnecessary as when once adjusted to mill to the correct size no further adjustment is required in duplicating work until the cutter should become dulled and have to be reground.

The starting and stopping of the whole mechanism is by the stop motion and hand lever at the extreme left of the machine front, but the only hand operation is to move the carriage back for chucking the work and then re-entering the cutter to the starting position. Because of these features in operation, it is explained that the machine can be run by inexperienced machine hands or by girls.

The cutter spindle and work spindle are driven by separate belts from the same countershaft, the work being held in some sort of chucking device on the main spindle. The head stock holding the main spindle swivels on the bed so that taper internal or external threads can be milled the same as straight. The power



Rapid Internal and External Threading Is the Function of This Automatic Hob Thread Milling Machine

drive to the main spindle is through change spur gears and worm and gear. The same drive controls the back shaft on which is the lead cam and depth feed cam. The carriage, with its cross slide, upon which is mounted the cutter spindle head, is moved the pitch of the thread by the lead cam and the entering and withdrawal from the work of the cutter spindle on the cross slide is by the depth feed cam. Varying feeds and speeds are taken care of by the countershaft pulleys and by change gearing on the machine. The oil pan is cast integral with the base of the machine, one half the base being used for an oil reservoir and the other half for a tool cabinet.

Milling speeds depend on the material milled, the quality of the cutters, and the finish required, 6 to 9 in. per min. being given by the manufacturer as a general average figure. By substituting a milling cutter for the threading hob small forgings can be milled, and by changing the shape of the feed cam irregular shapes can likewise be milled. Since both the milling and threading can be done on the same machine, milling cutters and threading hob can be mounted on the same arbor and a piece having both operations can be completed in two revolutions of the work.

Properties of Cold-Rolled Metals

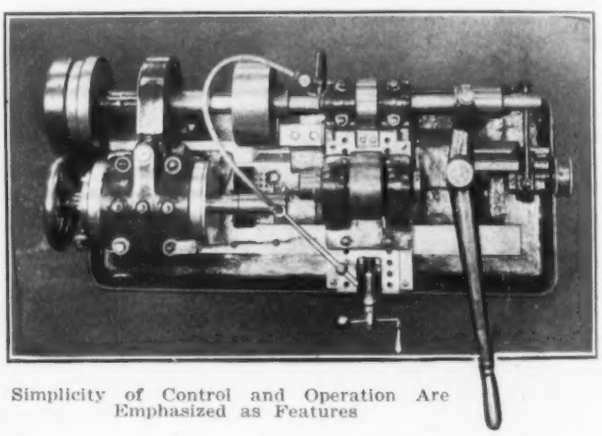
The results of some tests of cold-rolled metals and alloys were discussed and tabulated by Doctor Pomp in the *Zeitschrift des Vereines Deutsche Ingenieure* for March 1, 1919. A summary is as follows:

The specimens were supplied in bars of 10 mm. by 4 mm. cross-section, and were rolled down to thicknesses of 3.5, 3, 2.5, 2 mm., the reduction in thickness amounting to 0.5 mm. in each operation. The specimens were submitted to tensile strength and elongation tests, and further to Brinell hardness tests; in the latter case a ball of 4 mm. diameter was used and the load applied within 20 sec.

The copper examined, a metal of good commercial purity, increased in strength by 79 per cent maximum (for the 2-mm. thickness) as the thickness was reduced, first rapidly, then more slowly; the hardness curve was of similar shape, but the increase in hardness was more marked, 122 per cent max. The elongation diminished, soon attaining a fairly constant value.

The zinc specimens tested were very little affected by the cold-rolling. A zinc-aluminum alloy, containing 3.50 per cent of aluminum, did not show any material change either in strength or in hardness; but the elongation decreased markedly as soon as the thickness was reduced more than 1 mm.

The specimens of electrolytic iron behaved much like the copper specimens; the maximum values attained, increases in strength of 69 per cent. and in hardness of 115 per cent., were, however, lower than in the case of copper.



Simplicity of Control and Operation Are Emphasized as Features

The mild steel examined also resembled copper in its behavior, but the maximum increases, 88 per cent in strength and 156 per cent in hardness, were slightly larger than those observed with copper; the elongation diminished, rapidly at first, then more slowly. The composition of this mild steel was: 0.03 per cent of carbon, 0.29 per cent of manganese, 0.01 per cent of silicon, 0.019 per cent of phosphorus, and 0.025 per cent of sulphur.

An analysis of the electrolytic iron is not given; there is a reference to the copper bands of shells, however, and the iron was probably produced by the electrolysis of ferrous chloride, which was practised on a large scale during the war in Germany for the purpose of obtaining an iron which might serve as a substitute for copper.

W. B. Ogden and H. M. Schaab have applied for a patent on a method of preparing open-hearth furnace bottoms, the application covering primarily the manner of distributing dolomite in the furnaces between heats. Under the prevailing system, material for open-hearth bottoms is shoveled into the furnaces and distributed by hand after the furnaces have cooled to such an extent that work is physically possible. This results in a daily delay of an hour or so. The inventors claim that by their device the bottoms of open-hearth furnaces can be re-made without shutting off the gas and the consequent delay in bringing back the furnaces to steel making temperature. Both of the inventors are employed in steel-making plants that are located in the Mahoning Valley.

EXPORT BUSINESS SLACK

Few Inquiries from Europe, but Orient Continues to Buy Despite Prices

Export business continues slack in all markets but the Orient, where exporters with good connections report numerous inquiries, in spite of rising prices and difficulty in placing orders. Many large orders are being lost by exporters to this market through the sudden rises in prices. A recent example of this was a Japanese export house that quoted 5.80, f.o.b. New York, on 3500 kegs of wire nails. By the time a cabled acceptance was received the price had risen to 6.55, f.o.b. New York. Although European countries continue inactive, Belgium recently began inquiring for sheet bars. Present prices of sheet bars, however, preclude the possibility of much business. One exporter recently received several large inquiries from Italy for pig iron.

An exporter to Japan has been able to place an order for 1000 tons of ½ to ⅞-in. bars, and the same concern, through connections in France, received and filled an order for 2000 boxes of tin plate. Another Japanese export concern within the past week has filled orders for about 1000 tons of ¼ to 1-in. bars. Several export companies dealing with South American markets report a considerable number of inquiries of late, and one company recently shipped several overhead traveling cranes. The same company has orders from the Orient for several locomotives, and has shipped small quantities of chrome nickel steel to Switzerland. Another concern has orders from South America for iron car wheels and axles totaling about $40,000. An exporter, who under normal conditions deals mostly with Europe, states that within the past two weeks he has placed orders for more light rails for shipment to Japan than ever before to any other country. The demand from Japan for No. 30 gage sheets continues as strong as ever.

Tinplate is in good demand for export at around $10 per box, Pittsburgh. Exchange between Japan and the United States is slightly against the former, which may have the effect of limiting purchases. A leading steel export corporation may decide this week to open its books for third quarter, in which event it will be in a position to book orders for about 300,000 tons of steel.

Italian Workers Released

WASHINGTON, March 9.—Alfred P. Dennis, American commercial attache at Rome, reports to the Bureau of Foreign and Domestic Commerce that he has received information that the Ilva Iron & Steel Co. released the middle of January between 3500 and 4000 workers. The ores employed by this company are mined on the island of Elba, which is capable of supplying at present about 600,000 tons of ore to the Italian iron and steel industry. Ilva's curtailment of production is due, he says, not to any diminishing supply of raw ore or to any slackening in the local demand for iron and steel, but solely to the scarcity of coal and to the mounting cost of importation.

"The outlook for the metallurgical industries in Italy is anything but promising," says Mr. Dennis. "The continued drop in the value of the lira in Italy's coal-purchasing market stands to cripple the business of smelting native ores. It is quite significant that a leading concern, such as the Ilva Iron & Steel Co., should trim sail to the extent of discharging in a single week between 3000 and 4000 employees."

Demand for American Machinery in Sweden

WASHINGTON, March 9.—There is a strong demand for American machinery in Sweden, according to Consul Walter H. Sholes, who has sent a report on the subject from Goteborg to the State Department.

"The importation of machinery into Sweden during the war, especially during its last two years, was exceedingly small," says Mr. Sholes. "As a result stocks are exhausted, and machinery in use to-day, because of intense use and incessant wear during the war, stands in need of replacement. When the importation was resumed great cautiousness characterized the market, but purchases are now steadily increasing.

"Germany's opportunity to recapture the market lay in making good use of the prevailing low rate of exchange, and there could hardly be offered any competition to German prices as long as that country's small stocks lasted.

"When German exportations ceased and the much-expected decline in prices did not materialize the necessity arose for Swedish manufacturers to import machinery to keep the wheels of their industries moving, and the day for American machinery exporters arrived.

"American offers were favored by the generally known Swedish predilection of American goods, because of the excellent American workmanship and the high standard so far carefully maintained. But there is still much uncovered ground in this line. The best way to promote business is to send the trade plenty of printed matter and illustrated catalogs, to appoint active and representative agents, and when offering goods for sale to quote rockbottom prices c.i.f. Goteborg.

"The following machinery is in greatest demand:

"Machine-shop equipment, notably lathes and planes, which were formerly imported from Germany.

"Shipbuilding machinery, formerly from England.

"Agricultural machinery, except portable engines and threshing machines, which are made in Sweden and exported in large quantities to South America.

"Gasoline engines from 10 to 20 hp., but no coal-oil engines or machines of the Diesel-motor type.

"Printing presses.

"Woodworking machinery adaptable to ready-cut house manufacturing.

"American exporters should bear in mind that Sweden is an important manufacturer of electrical machinery, Diesel motors, saw-mills, wood-pulp machinery, portable engines, and threshing machines."

Hungary's Iron Industry

WASHINGTON, March 9.—A cablegram received through official channels from Budapest states that the iron industry of former Hungary produced yearly 20,000,000 metric quintals (1 metric quintal = 220.46 lb.) of iron ore; and that the only remaining mine, at Rud-Banya, can produce less than 4,000,000 quintals and, it is alleged, will be exhausted in eight years. Of the former iron and steel industry 40 per cent is left to new Hungary against its 23 per cent of raw material, so that 10,000 workmen will be out of work. A furnace and rail mill that formerly employed 4000 workmen is now entirely without ore because the mines and fuel are now in Czechoslovakia. Of the engineering industry, most important in old Hungary, with a yearly production valued at 212,000,000 crowns and with 41,000 employees, 90 per cent will be left with less than 20 per cent of the necessary raw material.

Favor Trade with Russia

WASHINGTON, March 9.—Continued efforts are being made to bring about action by the State Department lifting the ban on trade with Russia. A committee of the American Commercial Association, which was formed recently by a group of exporters interested in Russian trade, called upon the State Department to present a memorial urging immediate action. It was declared by members of the committee that business men of other nations are already undertaking or laying plans for trade with Russia, and that American business men should no longer be prevented from participating in the trade.

The recently organized Continental Tool Works, Detroit, will be joined by S. F. Wall and T. M. Olson, who have been identified prominently with the Michigan Tool Co., but have just severed their connections with it. The former was secretary and treasurer, the latter manager.

Cleveland Declaration on Labor Policies

Chamber of Commerce Committee Including Employers and Employees Make Report — How the Sliding Scale Operates in Fixing Wages of Puddlers and Mill Workers

THE committee on labor relations of the Cleveland Chamber of Commerce has adopted a declaration of principles which has been submitted to the members for their consideration before final action is taken by the board of directors. The document is signed by 26 members of the committee, including Sheldon Cary, president the Browning Co.; Edgar E. Adams, general superintendent the Cleveland Hardware Co.; H. B. Bole, vice-president the Hydraulic Pressed Steel Co.; C. W. Hotchkiss, manager the National Malleable Castings Co.; John G. Jennings, vice-president the Lamson & Session Co.; Crispin Oglebay, president the Ferro Machine Co.; H. C. Rock, vice-president the Van Dorn Iron Works Co.; Stephen W. Tener, manager of the Accident and Pension Department of the American Steel & Wire Co.; Thomas B. Wright of the American Multigraph Co.; William G. Lee, president Brotherhood of Railway Trainmen, and Warren G. Stone, grand chief of the Brotherhood of Locomotive Engineers.

The declaration emphasizes the fact that public interest is paramount to that of the individual employers and employees. It is asserted that increased production is a prime factor in reducing commodity prices. In regard to collective bargaining, the statement is as follows:

Representative Negotiations (Collective Bargaining)

Proper industrial relations are promoted by practical means of communication and negotiation between an employer and his employees. Where the channel of communication existing between an employer and the individual employee does not offer employees suitable means of negotiation with their employer, the employer should seek to establish mutually satisfactory means. For this purpose representative negotiation is advocated.

Representative negotiation is defined as that form of collective bargaining which provides for negotiation between an employer and duly accredited representatives of his employees, regarding hours, wages, and all other matters properly affecting their relationship. Employees' representatives should be duly accredited, should be chosen by the employees, from among their own number, unless otherwise agreed by employer and employees, and be empowered by the employees to negotiate for them. Such negotiation should be under control of the parties immediately concerned.

When employees of any establishment desire to do so they should have the option of choosing, without restriction on the part of the employer, a competent adviser or advocate to meet with representatives chosen by and from among the employees in negotiations with their employer. Representatives of employees, selected by and from among their own number, should be assured that no discrimination will be made against them by their employer because of anything said or done in their representative capacity.

In those industries where an establishment cannot practically be the unit of representative negotiation, the principle of representative negotiation between a group of employers and groups of employees is advocated. Under such conditions it is essential that the principles of this document be applied wherever practicable.

Nothing herein is intended to abrogate the right of an individual employee to negotiate directly with his employer.

Employers and employees should uphold in their integrity all arbitration awards or agreements entered into between them.

As to open or closed shop, the statement holds that freedom of contract and of employment must never be impaired. Employers should not discriminate on account of membership in unions and employees should not arbitrarily insist that employment with any establishment be conditioned on membership or non-membership in a union. The giving of full information by employers to employees on matters of mutual interest is urged and coercive measures are announced. The opinion is asserted that machinery should be set up to develop and crystallize public opinion to prevent strikes and lockouts. While the committee does not seek to act as a medium for settlement of labor disputes, it is willing to act on request either as arbitrator or as a board of investigation for the information of the public.

The Sliding Scale Plan

One of the most successful profit sharing plans in the country is the sliding scale governing wages in rolling mills, whereby employees in puddle mills, sheet mills and tinplate units are paid according to the selling price of the product. If the selling price advances, their compensation automatically increases and on the other hand declines if the sales price decreases.

The wage rate is determined bi-monthly at meetings between representatives of the employees and representatives of the Amalgamated Association of Iron, Steel and Tin Workers, when sales sheets are examined covering shipments for the two previous months. The Amalgamated is usually represented by one of its officers, either President M. F. Tighe of Pittsburgh or another official, and workers in the mills who are members of the constituent lodges. In determining the boiling rate, these representatives meet a representative of the Western Bar Iron Association, composed of 25 companies, usually James H. Nutt, secretary, located at Youngstown, Ohio.

In fixing the rate for sheet and tin mill workers, the Amalgamated delegates meet with a representative of the Western Sheet and Tinplate Manufacturers' Association, of which Mr. Nutt is also secretary. There are 20 companies in this organization.

Many independent mills pay the same rate to their employees in the affected divisions as the companies which recognize the Amalgamated, and for that reason the bi-monthly settlements are of importance to a large group of workers. Occasionally the independents pay slightly above or somewhat below the scale. For instance, it is reported the Youngstown Sheet & Tube Co. is paying its puddlers $13.88 a ton for the March-April period, an advance of 50 cents a ton over the rate paid in the union mills.

An agreement is entered into annually and the present contract between the unions and the mills expires June 30, 1920. In the meantime a wage conference will be held in June, when a new agreement will be negotiated and officials of the Amalgamated are already working on this, preparatory to asking an increase in the base rate.

A salient provision of this contract is that "in case of a grievance arising at any mill, there shall be no cessation of work by men until same has been investigated through the proper channels, and has been finally passed upon by the district executive committee of the Amalgamated Association."

The agreement covers in detail the rate to be paid for the various operations, such as boiling, busheling on sand bottom, busheling on cinder bottom, other operations in muck and puddle mills, and knobbling, shingling muck iron and rehammered iron, shingling charcoal iron, heating and shingling slabs and doubling, operations in bar and 12-in. mills, plate and tank mills, guide, 10-in., hoop and cotton tie mills, production of angles, shapes, channel iron, hame iron, "T" iron, ovals, half-ovals, crescent bars and other similar products.

It specifies the rate that shall be paid each skilled worker in sheet and jobbing mills, including the roller, heater, heater's helper, shearman, pair heater, rougher, catcher, matcher, doubler and others. It makes provision also for other details relating to working conditions.

Boiling rate for March and April of $13.38 per ton, in mills operating under the Amalgamated agreement, is based on a 2.70c. card and is somewhat below the rate paid puddlers for the corresponding bi-monthly

period in 1919, when the settlement was based on a 2.75c. card. The new rate establishes the second wage advance for puddlers in 1920. At the Jan. 1 examination, a card of 2.55c. was disclosed, giving boilers $12.62 per ton. This was an advance of 24c. per ton, from $12.38 on a 2.50c. card, the rate which prevailed from July 1, 1919, to the end of the year, or for the last three bi-monthly periods in 1919. Since the first of the year, then, the card rate has advanced four points, from 2.50c. to 2.70c., and puddlers have been increased $1 per ton, from $12.38 to $13.38.

In the Amalgamated agreement the card rate for bar iron is figured up to 4c., which would create a boiling rate, per ton of 2240 lb., or $19.88. The peak card rate during the war was 3.45c., which prevailed during the last two bi-monthly periods in 1918, and would have established for puddlers, under the existing contract, a rate of $17.12 per ton.

Pennsylvania Safety Congress

HARRISBURG, PA., March 9.—Of particular interest to the iron and steel industry of Pennsylvania is the Pennsylvania State Safety Congress, which has been called to meet in the State capitol during the week of March 21, by Commissioner of Labor and Industry C. B. Connelly. This congress has been called by Commissioner Connelly to work out "A practical program for industrial safety that will touch every industry in the Commonwealth." It will conclude with the tenth conference of industrial surgeons and physicians. All of the meetings will be general with no departmental conference or commercial exhibits.

"The demands of the great war upon industry and the consequent lowering of standards of industrial safety, the period of readjustment and the industrial unrest make it imperative that Pennsylvanians meet the challenge of the hour," says the Commissioner in calling the conference.

Charles M. Schwab, chairman of the Bethlehem Steel Co., Bethlehem, Pa., will be one of the speakers at the Pennsylvania Safety Congress, which will be held here during the week of March 21, under the auspices of the Pennsylvania Department of Labor and Industry. Among the other prominent industrial and professional men and women from every section of the country will be Samuel Gompers, president of the American Federation of Labor, and Theodore Roosevelt, Jr. Forty other speakers will attend.

Governor Sproul in inviting the representatives of industry to the congress says:

"This congress is a continuation of the welfare and efficiency conferences which were held in the past. Due to the war, these have been discontinued since 1917. It is evident that too much emphasis cannot be placed upon the matter of industrial safety, with the purpose of reducing the great number of deaths and injuries.

"The topics to be discussed at this congress will cover the pressing problems that face the industrial life of to-day. It is particularly fitting, therefore, that this commonwealth should be the center of interest for the industrial leaders of the nation, especially at this time."

Owing to demands from manufacturers of safety appliances for an opportunity to display their products, a commercial exhibit will be a feature of the congress. Previous announcement had been made that no commercial or industrial exhibits would be made.

Building Homes for Employees

During the past five years Youngstown, Ohio, steel companies have expended $10,000,000 in building homes for employees, the Youngstown Sheet & Tube Co. and the Carnegie Steel Co. leading in this respect. Furthermore, both companies have highly developed welfare departments whose facilities are accessible to the most humble employee.

This expenditure was made with the primary purpose of improving the living conditions of its workers, chiefly foreign-born, to prevent overcrowding, to enable the workers and their families to live under modern sanitary conditions and to promote Americanization.

Houses were built to be sold to employees on a very moderate deferred payment basis, and other groups to be rented at a nominal rental. One of the salient stipulations made by the Youngstown Sheet & Tube Co. was that foreign families would not be allowed to have boarders in these houses.

This ruling was decided upon after extensive investigation in which it was found that the practice of the foreigners in keeping boarders tended to induce immorality, low standards of living and ill health due to crowding. In many cases this inquiry disclosed that beds were occupied 24 hours without change of linen, being used by day and night shifts.

As a consequence of the restriction, however, and an indication that foreigners resent some forms of Americanism, it is cited by officials that about 100 houses are now vacant. This situation exists in spite of the fact that there is an acute house shortage in the territory and property is bringing the highest rental in its history. The foreigners insist, in many cases, upon retaining old world standards, living most frugally, and neglecting themselves and their children.

It is pointed out that the process of changing the present generation of foreign born workers in the industry will be a slow one. Among the principal considerations of the average foreigner is to provide against a miserable and poverty-stricken old age, with which they were so familiar in their native lands. To do this they hoard their money and very frequently oppose American standards because they are more costly.

Foreigners have large bank deposits, in the aggregate, in the Youngstown district, as figures of the foreign banks and foreign departments of American banks testify.

While officials are not discouraged in their efforts to induce better living conditions among this element of the population in our industrial centers, they fully realize the serious difficulties which must be overcome. Their chief hopes of the fulfillment of their plans for bettering the condition of the foreigner, especially the foreign worker in the steel industry, lie in the readiness with which the children of these people grasp American ideas and readily adopt American standards.

Reading the Worker's Mind

Whiting Williams, formerly director of industrial relations of the Hydraulic Pressed Steel Co., Cleveland, delivered an address before the Boston Chamber of Commerce members at the Copley-Plaza, recently, on "What's on the Mind of the Worker?"

Mr. Williams spent seven months as an unskilled worker in steel plants, coal properties, a railroad roundhouse, an iron foundry and in other establishments, in order that he might study the workingman in and out of employment. He said the unrest among the working classes is based on three things: the tremendous importance of the unskilled laborer of having a daily job; the relation between tired muscles and heated tempers; and the ignorance of the unskilled worker as to the real character of the company by which he was employed.

To these three causes were added the considerations which affect all classes of people, the feeling that the high cost of living was giving us a run for our money; the idea that somebody was profiteering, and the inability to understand why we still go under war conditions after the coming of peace. "With all these things in mind," said Mr. Williams, "it was possible to get a pretty good idea of a cross-section of the mind of the wage worker in this country."

But as Mr. Williams sees it, there are few among the workers who favor lawless means. The agitators are a handful in proportion to the masses. Yet the latter may prove better salesmen than the employing class when it comes to selling ideas to the workers. "These chaps are at present showing better psychology, using better salesmanship, than you and I. We are saying: 'Who are these waps? Where did they come from? Why don't they go to our schools?' While the

agitators are talking to them about the things in which they are interested." Mr. Williams told of the protection which the workmen receive through membership in unions, especially as against foremen, who might otherwise discharge them for small reason.

He saw the remedy for much of the unrest in efforts to give the workingman a better chance to develop an interest in his job and to show efficiency in it; in an attempt to make work steadier, even if the cooperation of customers has to be invoked; in keeping in mind that the workingman's troubles largely come from his anxiety because of his love of his family; and in remembering that opportunity should be for the young and security for the old.

Will Have Medical Examinations

Garret A. Connors, safety director of the Truscon Steel Co., Youngstown, Ohio, announces that with completion of a new building to house the health, service and advice departments, medical examination will be required of each applicant for position, in order to safeguard the working force. Later all old employees will be requested to take the examination. "With this service," states Mr. Connors, "we will be in a position to place our employees and applicants where they are best fitted physically. It will also let every man know his physical condition and enable him to treat any ailment before it gains too great headway. The service will be wholly confidential."

During the period from Aug. 1, 1919, to Jan. 31, 1920, a total of 6467 accident cases were handled by the welfare department. In the same period 1483 medical cases, exclusive of accident cases, were treated among employees.

New Cincinnati Agreement

An agreement has been reached between the Iron Workers' Union and the Cincinnati Iron League regarding the wages to be paid workers for the next six months. Last June an agreement was signed giving the men 85c. per hour the first year, 87½c. the second and 90c. the third year. The high rate of wages prevailing in other cities has attracted a large number of Cincinnati iron workers, with the result that building operations were considerably hampered, and in order to keep the men at work the wages have been increased to $1 an hour until Sept. 1.

In the Field of Labor

A settlement has been reached in the strike of fabricated steel workers and lockout of structural steel workers at Indianapolis. The fabricated steel workers demanded a closed shop and struck early in January. Later the structural workers refused to handle steel made by non-union men and they were locked out. The plants affected were Hetherington & Berner, Central States Bridge Co. and the Insley Iron Works. Three hundred men were out. Under the agreement, contractors, although not recognizing the local union to which the fabricating steel men belong, agree to meet with committees of their own employees to adjust working conditions and not to discriminate against members of the union. The structural workers agree to handle products from the three fabricating plants concerned.

The General Electric Co., Schenectady, N. Y., has announced that its plan for employees' savings and investment, placed in effect on Jan. 1, has proved very successful. A total of 11,758 employees at the different factories and branch offices has subscribed to company debenture bonds and United States Victory notes to an amount of $1,969,800. Of this aggregate, 9996 workers subscribed to the company bonds totaling $1,788,250, and 1762 workers subscribed to the Government notes to an amount of $181,550.

Union machinists at Jersey City and Harrison, N. J., have arranged for the establishment of a chain of six co-operative stores where "everything essential to the laboring man" will be on sale.

The State Department of Internal Affairs, Pennsylvania, has issued a statement showing that wage scales in various industries at Philadelphia increased 120 per cent in 1918, as compared with the previous year. The value of production in 1918 was $1,913,852,400, as compared to $1,559,148,200 in 1917.

Co-operative buying among employees of Mahoning Valley steel plants has reached proportions where wholesale and retail dealers are registering objections, but without result. The plan of buying in a co-operative way was inaugurated because of the high prices charged by grocers, meat dealers and merchants in all lines. It is claimed prices were advanced following each wage increase. Employees of one plant purchased over $21,000 worth of foodstuffs in this manner in January. A representative has been chosen who visits jobbers and wholesalers throughout the country and buys commodities in large quantities. Substantial economies have been effected by employees.

A joint meeting of the Chicago contractors and the building trades unions will be held soon to discuss a proposed wage scale of $1.25 per hr., demanded by the workers for all the crafts. Many Chicago contractors are said to be paying that wage now, because of the shortage of labor.

The St. Louis Home & Housing Corporation, fostered by the St. Louis Chamber of Commerce, and capitalized at $2,000,000, fully paid, will begin April 1 the construction of its first 100 homes to be sold to employees of industrial plants in St. Louis and to be built in the vicinity of various plants. The buildings are to be of fireproof construction and no two alike will be built in the same group. The capital of the company, through a revolving system of operation, is expected to finance about 10,000 houses to be constructed within the next five years. Nelson Cunliff, former park commissioner of the city, is general manager of the corporation.

The McKeesport Tin Plate Co., McKeesport, Pa., recently bought considerable ground near its plant on which it proposes to build a large number of homes for its employees. These homes will be sold to employees at actual cost, and on account of the large number to be built, minimum cost of erection will be secured by the company.

The Rockford Malleable Iron Works, Rockford, Ill., has let a contract for a six-family apartment building to be constructed for the use of employees. It has also arranged to move an old building to the same site to be remodeled into a modern apartment house. The company now has 18 homes near its plant, which are rented to employees only.

Three Hamilton, Ohio, manufacturing plants have made preparations to open a large grocery store for the benefit of their employees, for whom goods will be purchased and sold at cost. The firms are the Niles Tool Works, the Hooven-Owens-Rentschler Co. and the Black & Clawson Co.

At the plant of the United Shoe Machinery Corporation, Beverly, Mass., approximately 2000 workers quit work March 5, while considerably more than that number remained at their places. The unions object to the form of contract with the employees. The management in a public statement signifies its intention of continuing the contracts in question.

The Stanley Insulating Co., Great Barrington, Mass., non-breakable thermos bottles, has adopted a group bonus plan to include all employees. Under the plan the more bottles produced the more the men will receive in wages.

The American Bosch Magneto Corp., Springfield, Mass., has joined the long list of those companies furnishing insurance to employees. The plan also embraces compensation for sickness, and will be managed entirely by an executive committee of employees.

PERSONAL

E. D. Baker, purchasing agent American Steel Export Co. since its inception several years ago, has resigned to become general manager of the Merchants Metals Corporation. The Merchants Metals Corporation, now being incorporated, is capitalized at $1,000,000, with offices at 347 Madison Avenue, New York, until May 1, after which it will be located in the Woolworth Building. The new company will engage in a general trading, jobbing, salvaging, wrecking and liquidating business. Identified with it are Theodore Freideberg, president Manhattan Machinery Exchange, New York; Charles G. A. Pfitsch, manager International Bureau of Supplies, New York; Walter B. Eichleay and Ralph D. Young of the John Eichleay, Jr., Co., Pittsburgh; Joseph G. Hitner, president Henry Hitner's Sons Co., Philadelphia; Carl R. Briggs, president Briggs & Turivas, Inc., Chicago.

J. E. GOOD

E. D. BAKER

J. Edmund Good has been appointed general purchasing agent for the American Steel Export Co. to succeed Mr. Baker. Mr. Good has been associated with the company for the past three years, having first occupied the position of manager of the bolt, nut and iron division and later that of assistant general purchasing agent. He has just returned from an extended investigation of steel and iron trade conditions in the Far East. He was previously with the American Iron & Steel Mfg. Co., now owned by the Bethlehem Steel Co. He spent several years in the San Francisco office of that company and about ten years in the New York office in addition to several years at the mills.

H. L. Kirsh, assistant general manager Western Malleables Co., Beaver Dam, Wis., has been promoted to general manager, filling the vacancy caused by the death of Ernest E. Smythe on Feb. 9.

G. Kaehler has been elected president, Aldo Bolognesi, vice-president and general manager and Frederick L. Reid, secretary and treasurer of the Acme Storage Battery Corporation, Poughkeepsie, N. Y.

Harry C. O'Neill, for several years commercial agent with the American Express Co. at Detroit, has recently joined the J. R. Stone Tool & Supply Co., Detroit.

L. W. Francis, president Witherbee, Sherman & Co., New York, returned recently from Cuba where he spent several weeks examining ore properties.

George D. Fried has recently become associated with E. E. Pratt & Co., Inc., exporters and importers, at 280 Broadway, New York. Mr. Fried, who is a civil engineer, was formerly engaged on engineering construction and later was one of the executive managers of the export firm, Peerless International Corporation, New York. In his new position all Far Eastern business, handling principally chemicals and steel, will be under his supervision. E. E. Pratt & Co., Inc., was organized in June, 1919, by Dr. E. E. Pratt, formerly chief of the Bureau of Foreign and Domestic Commerce, Department of Commerce, at Washington.

Lester P. Lane has established himself in business as a distributor of iron and steel products for domestic and foreign consumption as the Iron & Steel Commerce Co., with offices at 126 Liberty St., New York. He was for some years identified with the Pennsylvania Steel Co. in New York, and subsequently with the Bethlehem Steel Co. when that company acquired the Pennsylvania company, and in the last few years has devoted himself largely to the export trade, part of the time as a member of the Smiley Steel Co. and subsequently on his own account.

At a recent meeting of the stockholders of the Buffalo Forge Co., Buffalo, new officers were elected as follows: Henry W. Wendt, president; Edgar F. Wendt, vice-president and treasurer; Henry W. Wendt, Jr., vice-president and secretary; C. A. Booth, vice-president and sales manager. The new directors include the above and H. S. Whiting.

Duncan W. Fraser, managing director Montreal Locomotive Works, Ltd., has been elected vice-president in charge of sales of the American Locomotive Co. and the Montreal Locomotive Works, Ltd., to succeed J. D. Sawyer, who resigned to become vice-president of Morton & Co., Inc., bankers.

W. R. Hill, manager of builders' hardware sales for the Yale & Towne Mfg. Co., Stamford, Conn., resigned on March 1 to take charge of sales and advertising for the Isko Co., Chicago. Mr. Hill was with the Yale organization for 22 years, is a member of the Sales Managers' Club of New York and the American Society of Sales Executives. The Isko Co. manufactures electrically driven and automatically controlled refrigerating machines for domestic and commercial use.

Harry A. Reichenbach, Allentown, Pa., an expert on waste heat boilers, who has been with the Alpha Portland Cement Co. for the past two and a half years as efficiency engineer, has resigned to accept a similar position with the Fuller Engineering Co., Allentown, Pa.

M. J. Dowling, formerly general superintendent of the South Side works of the Jones & Laughlin Steel Co., Pittsburgh, has resigned, effective from March 1, after 45 years continuous service in the steel business, nearly all that time in the operating departments. Mr. Dowling started his career with the Edgar Thomson Steel Works of the Carnegie Steel Co. at Braddock, Pa., in 1875, and in June, 1886, he went with the Jones & Laughlin Steel Co. as superintendent of the Bessemer department at its South Side works. He served continuously with this company for 34 years. He was presented by his former associates a gold watch, and a chest of silver.

Frederick O. Schmidt has been appointed general superintendent of the metal furniture department of the General Fireproofing Co. at Youngstown, Ohio. The company plans to considerably enlarge this department. Mr. Schmidt has been with the Stewart-Warner Speedometer Corporation of Chicago, for 12 years, part of the time as assistant superintendent and for the past four years general superintendent. He was a member of the Chicago Society of Efficiency Engineers.

At the annual meeting of the Pratt & Letchworth Co., proprietor of the Buffalo Malleable Iron & Steel Works, Buffalo, on March 2, changes were made in the officers of the company as follows: John C. Bradley, who for a number of years has been president, was elected chairman of the board of directors. John H. Bradley, general manager, was elected president and general manager. Franklin D. Locke, vice-president, was elected first vice-president. John P. Williams, manager of sales, was elected second vice-president, in charge of sales. Willis M. Edwards was re-elected secretary and treasurer.

Jerry Price, who was works manager of the North Elmwood plant of the Curtiss Aeroplane & Motor Corporation, Buffalo, during the war and who has recently

been connected with the Willys-Overland Co., Toledo, has been appointed works manager of the latter company. J. V. Zwiker has been appointed assistant works manager.

J. H. Bickey has been made superintendent of the Scott foundry department of the Reading Iron Co., Reading, Pa. He was formerly general superintendent of the Pennsylvania Brake Beam Co., Danville, Pa.

Col. W. A. Dibblee, late of the Ordnance Department, U. S. A., announces his connection as field manager with the Western Appraisal Co. and the National Industrial Engineering Co., Atlas Bank Building, Cincinnati.

George L. Bohannon, chief engineer of the Youngstown Steel Car Co., Youngstown, Ohio, has accepted a position with the Thomas Spalding Machine Co., Pittsburgh.

Gilbert F. Close, formerly a confidential secretary to President Wilson, and who accompanied the presidential party to Paris for the treaty negotiations, has assumed the duties of assistant to President Clarence H. Howard of the Commonwealth Steel Co. of St. Louis. Mr. Close is a native of New York and 38 years old.

C. W. Bassett, formerly assistant manager Budd Wheel Corporation, Philadelphia, has entered the production department of the Bethlehem Steel Co. at Bethlehem, Pa.

W. H. Eshelman has resigned as superintendent of plate mills of the Brier Hill Steel Co., Youngstown, Ohio. He has been in direct charge of the 84-in. and 132-in. mills since they started over a year ago, working under Charles B. Cushwa, superintendent of finishing mills. Mr. Eshelman was superintendent of the plate mill of the Sharon Steel Hoop Co. at the Haselton plant before going with the Brier Hill company and had previously been plate mill superintendent for the Republic Iron & Steel Co. His successor has not been named.

A. S. Henry, vice-president Railway Steel Spring Co., was added to the board of directors at the recent annual meeting.

Gustave A. Johnson, in charge of drawings, engineering department, Greenfield Tap & Die Corp., Greenfield, Mass., has resigned to accept the position of works manager, Blevney Machine Co., Newark, N. J., polishing belts.

J. G. Waldron has been appointed New York district sales manager for the general sales department of the Whitaker-Glessner Co., maker of open-hearth steel, with headquarters at 16 Desbrosses Street, New York.

Henry A. Brown has been made vice-president, in charge of engineering and sales with A. C. Towne, Inc., Buffalo, N. Y., small tool specialist and representative of the Illinois Tool Works. He is leaving the Rochester office of the Brown & Sharpe Mfg. Co.

C. S. Roberts, for the past three years and a half assistant structural sales agent, the Bethlehem Steel Co., Chicago, resigned March 1, to form the C. S. Roberts Co., Westminster Building, a steel sales company specializing in plain and fabricated structural materials.

Howard P. Fairfield, formerly assistant professor of machine construction at Worcester Polytechnic Institute, Worcester, Mass., has been made professor.

Howard Kenworthy has been placed in charge of a branch sales office opened by the Newton Steel Co., Newton Falls, Ohio, at 356 Leader-News Building, Cleveland.

A. T. Shurick, mining engineer, recently identified with the *Coal Trade Journal* and formerly with *Coal Age*, has become associated with F. C. Thornley & Co., Inc., constructing and consulting engineers, 31 West Forty-third Street, New York. The company designs, constructs and organizes for operation, installations for the mechanical handling of materials. It also acts in a consulting capacity in the valuation and appraisal of properties and preparation of engineering reports.

S. E. Flexer has become assistant to the chief engineer of the Fuller Engineering Co., Allentown, Pa., having formerly been with the Hercules Cement Corporation, Nazareth, Pa.

At the annual meeting of the stockholders of the Newark Stamping & Foundry Co., Newark, Ohio, the following directors were elected: J. N. Pugh, president J. N. Pugh & Co., brokers, Newark, Ohio; F. W. Moser, Newark, Ohio; R. A. Gulick, secretary the May-Fiebeger Co., Akron, Ohio; Goodnow Johnson, manager Bellaire Stove Co., Bellaire, Ohio; R. G. Barber, Newark, Ohio; C. F. Sites, capitalist; E. F. Ball, Newark, Ohio. It was decided to increase the capital stock of the company from $15,000 to $30,000. The May-Fiebeger Furnace Co., a subsidiary, is the selling company for the line of warm air furnaces. The stamping department manufactures auto accessories.

W. G. Sharp, who has been connected with the iron ore department of the M. A. Hanna Co., has been appointed general manager of the Marting Iron & Steel Co., Ironton, Ohio, succeeding Otto Marting. This appointment follows the purchase of a large interest in the company by Cleveland men and its reorganization.

Norman L. Baker, formerly with the American Steel Foundries, East St. Louis, Ill., has accepted a position with the Curtis & Co. Mfg. Co., St. Louis.

Claird K. Southard has resigned as sales manager of the Bellefontaine Steel & Bridge Co., Bellefontaine, Ohio, and has become associated with the Blaw-Knox Co., Pittsburgh.

Major William B. Gray has been elected president of the Hoffman Products Co., Seventh Street, Harrisburg, Pa., manufacturer of oil burners and other metal products, succeeding William M. Hoffman, Buffalo, who retires from this office and as a director. J. Allen Donaldson has been elected a director of the company.

At the annual meeting of directors of the Reading Iron Co., Reading, Pa., Leon E. Thomas was re-elected president. W. W. Williams, general manager, was elected vice-president and general manager in charge of operations and sales. J. M. Callen was appointed vice-president in charge of purchases and distribution of material. Other officers elected were: H. Y. Yost, treasurer; G. W. DeLaney, secretary; R. J. Wenger, assistant treasurer, and F. C. Smink, chairman of the board of directors.

Bennett E. Tousley has resigned as assistant to the president of the Manufacturers Trust Co. to become general manager of the Eastern Tube & Tool Co., Inc., Brooklyn, N. Y.

Joseph H. Lecour has been elected treasurer of the Mitchell-Rand Mfg. Co., 18 Vesey Street, New York, manufacturer of insulating materials. He succeeds W. E. G. Mitchell, who will devote his entire attention to his duties as vice-president.

O. H. Peters, general superintendent at the plant of the Emerson-Brantingham Co., Waynesboro, Pa., manufacturer of engines, machinery, etc., has resigned to become general manager of the plant of Clark Brothers & Co., Olean, N. Y., manufacturers of saw mill machinery.

Edward H. Reeves has become night superintendent of the Acme Wire Co., New Haven, Conn., having recently resigned as scientific assistant in the United States Public Health Service.

Maurice Legori, for the past two years manager in Argentina for Viele, Blackwell & Buck, New York, has been made manager of a foreign department newly created by Ray D. Lillibridge, Inc., 111 Broadway, New York. The department is to give advice in the matter of export advertising and sales. Mr. Legori was recently manager of export sales of the Wagner Electric Mfg. Co. He is a graduate in electrical engineering

of the Escola de Engenharia de Porto Alegre in Brazil, and he took post graduate work in the Technische Hochschule in Charlottenburg, Germany. He spent two years in Europe, part of the time associated with the Allgemeine Elektricitäts Gesellschaft in Berlin.

E. E. Yake, Gilbert & Barker Mfg. Co., Springfield, Mass., furnaces, fuel oil, equipment, etc., has resigned to accept a position with the Walworth Mfg. Co., Boston. Mr. Yake has been in charge of the Gilbert & Barker engineering department, including the inspection and maintenance departments, and also was the editor of *Vent*, the house organ of the company.

Charles M. Manly and C. B. Veal have established offices as industrial engineers specializing in the co-ordination of engineering and manufacturing requirements in the design, production and operation of automotive powerplants and vehicles at 250 West Fifty-fourth Street, New York. Mr. Manly was recently president of the Society of Automotive Engineers, and is well remembered as a co-worker with the late Prof. Langley in the early experiments in aviation, having himself designed an internal-combustion motor notable for its light weight in terms of the power developed. He also developed the Manly hydraulic drive for motor trucks.

O. M. Peters, general superintendent of the several manufacturing plants of the Emerson-Brantingham Co., producer of farm machinery, and former superintendent of the Geiser plant of the company in Waynesboro, Pa., has resigned to become general manager of Clark Brothers, Olean, N. Y., manufacturers of steam engines.

The stockholders of the Gilbert & Barker Mfg. Co., Springfield, Mass., furnaces, fuel oil equipment, etc., at a recent meeting elected the following officers: R. H. McNall, president; Charles C. Ramsdell, vice-president; William T. Raynor, treasurer; W. H. Wood, first assistant treasurer; F. L. Rowland, second assistant treasurer. A board of directors was also elected, consisting of F. D. Ashe, T. J. Williams, R. H. McNall, C. C. Ramsdell and W. T. Raynor.

John D. Capron, sales representative of the United States Cast Iron Pipe & Foundry Co., with headquarters at Chicago, has been appointed manager of the publicity department, with office at Burlington, N. J.

B. L. Verner, former sales agent, the Highland Iron & Steel Co., Chicago, has become connected with the Interstate Iron & Steel Co., Chicago, and on May 1 will succeed W. K. Kenly as purchasing agent of the latter company.

Arthur W. Schoof has resigned his position as gage expert, Greenfield Tap & Die Corporation, Greenfield, Mass., to accept a position at Dayton, Ohio.

OBITUARY

Death of James J. Flannery

James J. Flannery, a well-known business man of Pittsburgh, died at his home in that city, Saturday evening, March 6. Mr. Flannery, in connection with his brother, Joseph M. Flannery, who died Feb. 18, was largely instrumental in forming the American Vanadium Co. He was interested in many business enterprises in Pittsburgh and elsewhere, but in the later years of life devoted most of his time to the American Vanadium Co., which he, with his brother, sold recently to C. M. Schwab and J. L. Replogle. Besides his connection with the Flannery Bolt Co. and the American Vanadium Co., he was president of the Collier Land Co., the Keystone Nut Lock Co., the Montour & Lake Erie Coal Co. and the Oakland Savings & Trust Co., chairman of the board of directors of the Vanadium Metals Co. and a director of the Wharton Steel Co., of New York.

FRANCIS CHARLES SMINK, chairman of the board Reading Iron Co. Reading, Pa., died at his home in that city on March 3 at the age of 74. In 1902 he became president of the Reading Iron Co., succeeding George F. Baer. He was born in Kutztown, Pa., Sept. 8, 1845, the son of H. B. and Elizabeth Ebert Smink.

FRANCIS C. SMINK

He was educated in the Reading high school. His business career began as bookkeeper in a shoe manufacturing establishment and in 1864 he was made secretary to the superintendent of the Philadelphia & Reading Co. He resigned to accept a position in Bushong Brothers' Bank, of which he was cashier until 1877. Then he became business manager of the Reading Iron Works, serving in that capacity until 1889, when it was reorganized as the Reading Iron Co., with Mr. Smink as vice-president and general manager. He was also a member of the executive committee and a director of the Pennsylvania Steel Co. and was a director in its numerous subsidiaries. He was a director of the Temple Iron Co., Pure Oil Co., Reading Trust Co., Spanish-American Iron Co., Maryland Steel Co., and other companies. He belonged to the Franklin Institute, Philadelphia and American Institute of Mining Engineers, and the Manhattan and Railroad Clubs, New York.

PATRICK HENRY FERGUSON, of the Pittsburgh Steel Products Co., Pittsburgh, died Feb. 11, on a business trip at Richmond, Va., from pneumonia. He was born in Ottawa, Ill., March 12, 1876. He traveled for the Shelby Steel Tube Co. for several years and later became manager of the tube department of Peter A. Frasse & Co., New York. For the past 14 years he has been manager of the New York office, Pittsburgh Steel Products Co.

WILLIAM J. MCCURDY, vice-president and general manager Manufacturers' Iron & Steel Co., New Brunswick, N. J., died at his home, "The Pines," on Easton Avenue turnpike, on Feb. 29. Mr. McCurdy was born in New Brunswick 57 years ago. The Manufacturers' Iron & Steel Co. controls the Neverslip Horseshoe Calk Co., New Brunswick, the Bryden Horsehoe Works, Catasauqua, Pa., and the Neverslip Works, Montreal, Can. Mr. McCurdy served as chairman of the horseshoe committee of the War Industries Board.

THOMAS W. BURNHAM, president Kilby Mfg. Co., Cleveland, manufacturer of sugar making and other machinery, died at Pasadena, Cal., March 3, aged 75 years. He was a director of several Cleveland banks and associated with various business enterprises, and at the head of the Kilby company for seven years.

COL. J. D. PLATT, founder of the Platt Iron Works, and former president of the Barney & Smith Car Co., died at his home in Dayton, Ohio, on Feb. 25. Colonel Platt was 82 years of age.

HARRY B. WHALL, sales representative for the New England Steel Castings Co., electric steel castings, East Longmeadow, Mass., died Feb. 27 of pneumonia at his home at Dorchester, Mass.

JACQUES KALT, 78 years old, for many years chief clerk of the Reading Iron Co., Reading, Pa., died at his home on March 6 of paralysis.

Munitions Tax Sustained

WASHINGTON, March 9.—The Supreme Court has decided that the munitions tax of 12½ per cent on net profits is applicable to manufacturers making forgings to be furnished by other makers in the finished shells. Justices Day and VanDevanter dissented. The decision was upon cases brought by the Worth Steel Co., which sought to recover $74,857, Forged Steel Wheel Co., $246,920, and the Carbon Steel Co., $271,062 exacted under the munitions tax act of Sept. 8, 1916.

Exports of Iron and Steel Show Increase

Unfavorable Exchange Rates Do Not Prevent Larger Tonnages Moving to Foreign Ports—Imports of Iron and Steel Also Increase — Movement of Machinery Heavy

WASHINGTON, March 9.—Notwithstanding gloomy predictions of a decline in exports because of adverse exchange conditions, the figures for January show increases in exports of iron and steel over December. The exports of manufactures of iron and steel were not as great as during certain months last fall, but exceeded the totals in October, November and December.

Exports of Steel and Iron

	January		Seven Months	
	1919 Gross Tons	1920 Gross Tons	1919 Gross Tons	1920 Gross Tons
Ferromanganese	8	...	1,050	1,857
Ferrosilicon	956	55	3,313	244
All other pig iron	35,793	18,413	204,083	163,905
Scrap	632	4,234	1,184	26,583
Bar iron	10,331	1,795	49,071	19,304
Wire rods	15,056	8,825	89,017	55,327
Steel bars	29,276	43,765	279,977	318,938
Billets, ingots and blooms, n. e. s.	11,594	19,937	815,344	170,416
Bolts and nuts	4,341	2,158	20,054	17,340
Hoops and bands	7,614	3,745	31,439	21,754
Horseshoes	158	68	952	1,654
Cut nails	472	33	1,884	900
Wire nails	6,886	4,589	44,857	38,445
All other nails, including tacks	2,159	553	8,924	5,182
Cast-iron pipes and fittings	1,841	3,504	21,884	22,958
Wrought iron pipes and fittings	8,906	13,827	56,748	114,397
Radiators and cast-iron house-heating boilers	289	1,682	2,137	4,628
Railroad spikes	1,567	738	6,211	9,405
Steel rails	65,024	44,449	306,191	316,375
Galvanized sheets and plates	6,729	6,233	37,323	52,356
All other sheets and plates	2,096	3,530	203,249	21,035
Steel plates	67,324	75,592	395,425	366,564
Steel sheets	15,769	10,031	87,182	84,316
Ship plates punched and shaped	1,067	3,931	14,699	11,723
Structural iron and steel	30,248	27,550	149,482	166,817
Tin and terne plates	29,279	20,580	142,283	102,511
Barbed wire	4,257	5,881	157,311	63,038
All other wire	784	7,903	97,061	97,417
	360,456	333,601	3,228,341	2,199,604

Exports of machinery also were larger than in December, but somewhat less than in either October or November.

Imports of iron and steel also show an increase in January over December. The total imports amounted to more than any month for several months.

The exports of manufactures of iron and steel and also of machinery were less than in January of 1919. Imports in January were four times as great as in January, 1919. Exports of iron and steel manufactures totaled 333,601 gross tons in January, 1920, as against 254,767 gross tons in December, 295,045 gross tons in November, 302,456 in October, and 363,505 in September. The January, 1919, total amounted to 360,456 gross tons. For the seven months' period ending in January, the total exports were 2,199,604 gross tons as against 3,228,341 gross tons during the seven months in January, 1919.

The value of exports of manufactures of iron and steel in January was $70,226,411 as against $60,399,425 in December and $74,676,004 in November.

The pig iron of all kinds exported in January, 1920, amounted to 18,468 gross tons as against 36,757 gross tons in January, 1919. The December, 1919, total dropped to 14,612 gross tons, the totals in the preceding months having ranged from 21,000 to 24,000 tons. The exports of all pig iron in the seven months ending in January, 1920, amounted to 166,006 tons as against 218,446 gross tons in the seven months ending January, 1919. The pig iron exports in January, 1920, included 6437 tons to Japan and 881 tons to Canada.

The total exports of billets, blooms and ingots continued below totals of months last fall. The total in January was 19,937 gross tons as against 21,538 gross tons in December. The high mark during recent months was in September, when the total reached 37,513 gross tons. The total of exports of billets, blooms and ingots in January, 1919, amounted to 11,594 gross tons. For the seven months ending January, 1920, the total was 170,416 tons, which was far below the total during the seven months ending January, 1919, including the war period, which amounted to 815,344 tons.

Among the exports of billets, ingots and blooms during January were 1804 tons to France, as compared with 3461 to France in January, 1919, and 12,206 tons to Great Britain as against only 907 to Great Britain in January, 1919.

Exports of steel rails in January jumped considerably above the December total, but were below the total for November. Steel rails exported in January totaled 45,449 gross tons as against 34,149 in December, and 54,342 in November. The total in January, 1919, was 65,024. The total in the seven months period ending January, 1920, was 316,375 tons as against 306,191 tons for the corresponding period ending in January, 1919. A greater movement of rails to South American countries, and a falling off in shipments to Europe, is shown by comparison of the January figures with January of last year. In January, 1920, 6912 tons of rails were shipped to Brazil as against 105 tons in January, 1919, while 8388 tons were shipped to Cuba as against 5125 tons in January of last year. Rails shipped to France in January, 1920, totaled only 3114, while in January, 1919, although the war was over, the total amounted to 25,848 tons.

One of the largest increases in exports in January was in steel plates. The total in January amounted to 75,592 gross tons as against 46,746 gross tons in December, 63,684 tons in November, and 40,660 tons in October. The steel plates exported in January, 1919, totaled 67,324 tons. For the seven months period ending in January, 1920, the total was 366,564 gross tons as against 395,425 gross tons in the corresponding seven months period of a year ago.

Structural iron and steel exports increased in January, after a marked slump in December. The total in January amounted to 27,550 tons, while the December total was only 15,375 tons. The November total was 22,939 tons. An increase in the movement of steel to Japan is shown by the figures in structural iron and steel exports, the total in January, 1920, being 8434 as against 1195 tons in January, 1919. Canada received 5470 tons of this class of exports in January, 1920, as against 16,832 in January, 1919. The total for the seven months ending January, 1920, was 166,-

Exports, January to December, 1919, and January, 1920

	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
January	360,456	35,793	11,594
February	234,793	20,178	10,407
March	344,506	22,054	8,176
April	408,204	16,300	11,488
May	447,050	32,233	20,771
June	544,580	39,540	46,016
July	287,823	38,373	21,318
August	396,743	36,071	36,162
September	363,505	18,991	37,513
October	302,456	14,108	20,713
November	295,045	21,429	13,211
December	254,676	14,612	21,538
Total	4,239,837	309,682	258,907
January, 1920	333,601	18,468	19,937

817 as against 149,482 in the corresponding seven months of a year ago.

The value of exports of machinery in January was $30,856,432, which was only slightly above the value of machinery in January, 1919, when the total amounted to $30,106,567. The value of machinery exported in December was $27,252,866, which was less than preceding months, the total in November being $34,103,136, while in October it was $33,350,888, and in September $29,655,048. The total for the seven months ending January, 1920, was $206,683,972 as against $173,512,710 in the corresponding seven months of last year.

Imports of Iron and Steel

	January		Seven Months	
	1919 Gross Tons	1920 Gross Tons	1919 Gross Tons	1920 Gross Tons
Ferromanganese	850	2,771	9,544	20,481
Ferrosilicon	830	1,431	5,160	10,115
All other pig iron	172	19,753	222	67,965
Scrap	12,209	17,120	52,297	141,463
Bar iron	105	303	683	1,479
Structural iron and steel	26	168	2,011	754
Steel billets without alloys	950	2,701	19,745	12,284
All other steel billets	542	4,285	3,814	5,885
Steel rails	435	754	6,276	7,156
Sheets and plates	67	177	396	771
Tin and terne plates	...	41	...	213
Tin scrap	772	...	4,342	...
Wire rods	...	146	1,929	405
	12,875	49,650	106,419	268,971
Imports of Manganese Ore and Oxide				
Manganese ore and oxide of	47,504	21,463	293,971	128,822

Total imports of iron and steel in January amounted to 49,650 gross tons, which was a considerable increase over any recent monthly total. The total in December was 39,797 gross tons, that in November was 43,828 tons, and in October 40,705 tons. The imports of iron and steel in January, 1919, amounted to only 12,875 gross tons. For the seven months period ending January, 1920, the total imports of iron and steel amounted to 268,971 gross tons as against 106,419 gross tons for the corresponding seven months of a year ago. Imports of pig iron of various kinds totaled 23,955 gross tons, which was considerably in excess of the December total of 12,777 gross tons. Scrap imports fell off from totals of previous months, the total in January being 17,120 gross tons as against 20,218 in December. The imports of scrap in January, 1919, amounted to 12,209 tons.

There was a falling off from the amount of imports of manganese ore and oxide manganese which reached a high figure in December. The January imports amounted to 21,463 gross tons, while the December total was 36,376 tons. The total in November, however, was considerably less, being only 11,694 tons. The imports of manganese ore and oxide manganese in January, 1919, amounted to 47,504 gross tons. For the seven months ending January, 1920, the total was 128,822 gross tons as against 293,971 in the corresponding seven months period of a year ago.

O. F. S.

Exports of Machinery

	January		Seven Months	
	1919	1920	1919	1920
Adding machines	$204,450	$398,205	$1,300,743	$1,939,757
Air-compressing machinery	299,636	211,941	1,838,521	1,843,428
Brewers' machinery	453	47,750	59,049	142,494
Cash registers	231,757	285,241	705,198	2,546,964
Parts of	9,100	18,548	85,102	186,245
Concrete mixers	18,158	30,342	172,344	185,245
Cotton gins	31,473	13,384	75,635	75,932
Cream separators	61,870	68,214	489,070	555,920
Elevators and elevator machinery	161,298	99,328	1,534,620	1,256,284
Electric locomotives	24,501	139,446	144,428	767,404
Gas engines, stationary	52,549	55,768	315,802	429,094
Gasoline engines	5,094,745	2,514,512	20,085,661	16,306,186
Kerosene engines	1,295,100	.....	5,682,139	3,129,033
Steam engines	3,562,261	4,720,921	16,116,012	21,772,804
All other engines	255,261	225,066	3,651,527	1,550,555
Boilers	444,326	322,280	3,401,663	3,796,775
Boiler tubes	553,972	207,189	4,360,776	2,458,374
All other parts of engines	1,735,327	1,485,476	14,952,781	12,879,982
Excavating machinery	26,627	93,248	559,255	693,707
Milling machinery, flour and grist	99,903	96,044	806,984	877,738
Laundry machinery, power	29,944	150,750	210,806	615,102
All other	26,909	48,557	171,662	230,946
Lawn mowers	38,715	16,394	176,707	199,255
Lathes	459,152	631,271	4,831,123	5,012,353
Other machine tools	860,559	816,773	6,826,872	6,436,222
Sharpening and grinding machines	324,992	393,374	3,210,079	2,629,292
All other metal-working machinery	1,745,938	1,611,528	13,735,617	14,568,854
Meters, gas and water	61,577	43,883	329,769	403,895
Mining machinery, oil well	106,478	145,310	1,902,363	1,958,138
All other	956,874	645,395	4,900,308	4,291,397
Paper-mill machinery	297,468	188,012	1,154,619	1,812,594
Printing presses	192,610	1,199,022	1,060,910	3,240,359
Pumps and pumping machinery	572,445	800,307	3,527,185	5,337,899
Refrigerating and ice-making machinery	257,602	212,059	1,052,478	1,046,194
Road-making machinery	10,562	51,411	450,186	571,824
Sewing machines	1,145,616	1,271,604	5,873,378	7,180,722
Shoe machinery	182,028	226,821	917,017	1,748,098
Sugar-mill machinery	700,604	1,214,212	6,406,588	10,593,543
Textile machinery	901,341	.....	5,081,702	7,674,782
Typesetting machines	319,341	343,534	972,079	1,695,037
Typewriting machines	997,012	1,421,954	4,469,674	10,297,371
Windmills	11,057	60,981	534,386	602,410
Woodworking machinery, saw mill	100,798	62,131	811,155	382,122
All other	125,873	229,941	687,460	1,633,730
All other machinery and parts of	5,425,119	6,062,626	27,881,317	41,153,067
	$30,106,567	$30,856,432	$173,512,710	$206,683,972

Exports of machinery in January totaled $30,856,432 as against $27,252,866 in December, and $34,103,136 in November. Gasoline engines valued at $2,514,512 were exported in January, which, while an increase over former months, was only one-half the total of January, 1919, which amounted to $5,094,745. Metal-working machinery exported in January totaled $3,455,946 as against $3,405,680 in December, and $4,546,045 in November. Typewriting machines exported in January totaled in value $1,420,954 as compared with $1,627,715 in December and $1,258,395 in November.

New England Foundrymen's Association

At the March meeting of the New England Foundrymen's Association, held Wednesday, March 10, at the Exchange Club, Boston, Raymond M. Howe, Mellon Institute of Industrial Research, Pittsburgh, gave an interesting talk on refractories. Mr. Howe divided his talk into two divisions, dealing first with the manufacture of the different refractories, their composition, etc., for various purposes for which they are required; second, with the installation of fire-brick in various types of furnaces, cupolas, etc., with particular reference to the service obtained by the various varieties in different positions in the same furnace. The talk was illustrated by stereopticon slides prepared especially for this occasion.

ROLLING OLD ORDERS

Youngstown Mills Operating at Curtailed Rate —Coal Supply Short

YOUNGSTOWN, OHIO, March 9.—Steel production of a leading independent in the Valley averaged 70 per cent of normal in February, with pig iron output from 10 to 12 per cent higher. Another independent reports February steel output was between 75 and 80 per cent of normal. It is expected this average will be sustained and likely improved in March, despite serious suspensions during the early part of the month. At the end of the week, the Republic Iron & Steel Co. was compelled to duplicate its curtailment of the week previous, and Friday morning suspended the Brown-Bonnell and Bessemer departments and one of the tube mills in the Lansingville plant. Employees were notified the departments would be idle Friday, Friday evening and Saturday. The Republic company is operating its blast furnaces and by-product coke ovens at reduced rates.

Other district companies are making drastic curtailments, though some are not actually suspending. Pipe, skelp and plate mill departments, as well as sheet mills, were idle at the close of the week at the Youngstown Sheet & Tube Co. plant. Blast furnaces, open-hearth furnaces and coke plants were kept going with what little fuel remained. The Sharon Steel Hoop Co. has again suspended its plate mill for lack of fuel.

Imminent shutdowns at the plants of the Carnegie Steel Co. were avoided by timely coal arrivals. While the Brier Hill Steel Co. was on the ragged edge, its schedules were fairly well maintained.

Coal supply available for plant consumption averaged less than 50 per cent of requirements the last of the week. An operating executive of a big producer attributes the shortage to failure of the railroads to reassemble and distribute empties at the coal mines. Improvement in car supply is expected as the carriers rehabilitate their organizations, but it is also pointed out that movement of coal to the lakes and ore to the furnaces will utilize what additional car supply may be available during the next two months.

D. T. Murray, chairman of the Youngstown operating committee of the railroads, states box cars, gondolas and open top cars are being routed to this district from the East in large numbers to provide relief for the crippled industries. It is estimated 1500 carloads of finished steel products, or about 75,000 tons, were piled in mill yards last week, awaiting shipment. At one time the Carnegie Steel Co. had nearly 18,500 tons, ready for delivery, held in its yards and at its shipping warehouses.

Live stock cars are being eagerly seized upon by traffic departments in this dilemma and are being supplied in goodly numbers.

Two Pennsylvania mines of the Republic Iron & Steel Co., with a combined capacity of 80 carloads of coal or 4000 tons daily, were temporarily suspended because of the shortage of empties. Total available supply of cars for the two mines was 10 cars one day last week.

Confiscation of coal by the railroads is another deterring factor. For instance, operations of one producer were crippled recently when the Baltimore & Ohio seized 40 cars, containing about 1800 tons of coal, at New Castle, Pa., en route to Youngstown.

Coal arrivals for a 24-hour period have been as low as 300 cars. Republic Iron & Steel Co. is planning to change its Atlantic furnace at New Castle, a rated 350-ton stack, from Bessemer to basic iron about June 1. The change will take place as soon as the Bessemer ores are smelted. The company is now installing a double-strand pig machine for the basic melt. The basic iron is to be sold on the market.

While making repairs on a hot blast stove near the blast furnaces of the Carnegie Steel Co.'s Farrell, Pa., plant March 4, three workmen were killed by an explosion. They were enveloped in red hot ore dust and burned to death. The theory is advanced that an accumulation of gas in some of the chambers of the hot blast stove ignited from the hot bricks and flue dust.

Practically all plants are engaged rolling back orders, held up by intermittent operating conditions, and are still turning down new business. No sheets are available from makers for delivery during the first half. Urgent buyers are turning to jobbers and brokers in an endeavor to secure material. One jobber states he has been offered 10c. for galvanized sheets. Black sheet sales show variations from 6.50c. to 10c., with both black and blue annealed in heavy demand. The automobile industry is seeking substantial tonnages of highly finished product and buyers are filling orders in many cases from warehouse stocks. Consumers are willing to pay almost any price if they can get 30 to 45-day delivery.

The Falcon Steel Co., which rolled its first product March 1, on Monday coupled three additional mills to the mill drive, initial output consisting of black sheets. The jobbing mill is being warmed up preparatory to starting the last of March. With eight mills operating, the company's yearly capacity of black and blue annealed sheets is 70,000 tons. Pair and sheet furnaces are heated by powdered coal.

Six Million Tons Charged on One Blast-Furnace Lining

A remarkable record has been made by No. 3 blast furnace at the Ensley works of the Tennessee Coal, Iron & Railroad Co. at Ensley, Ala. This furnace is now out for relining after a campaign of 10 years, 7 months and 9 days, during which time it produced 1,429,788 tons of pig iron, which is the world's record on one lining. The amount of raw material which passed through the stack in the last campaign was 5,999,438 tons.

No. 2 blast furnace at the Ensley works, which was blown out Sept. 14, 1918, produced 1,196,358 tons of pig iron on one lining.

Will Manufacture Pressed Steel

The Powell Pressed Steel Co. will erect a plant at once at Hubbard, Trumbull County, Ohio, for the manufacture of pressed steel and stamped metal specialties. It is expected to commence production in May. The plant will be constructed in units, on an 18-acre site, the initial unit to have 55,000 sq. ft. of floor space. Other units will be added as the business develops. These directors have been elected by stockholders: W. J. Powell, H. F. Wylde, E. J. Powell, Ward Beecher, C. A. Cochran, George F. Alderdice and A. M. Henderson. Directors chose the following officers: W. J. Powell, president and general manager; H. F. Wylde, vice-president and sales manager; E. J. Powell, secretary and engineer; Ward Beecher, treasurer. The contract for the excavation and concrete work was awarded the Henderson Construction Co., Youngstown, and the erection of structural steel to the Hunter Construction Co., Youngstown. Machinery has been ordered and part of it has arrived. Stampings for automobiles, agricultural machinery and special stampings of various kinds will be manufactured. With the exception of Mr. Beecher, all officers of the company were formerly identified with the Youngstown Pressed Steel Co.

Figures have been issued by Martin H. Matheson, production manager of the J. W. Murray Mfg. Co., Detroit, to prove that on an average throughout the United States every man with an income of $2,500 a year or more drives his own motor car. "Furthermore," says Mr. Matheson, "if present production schedules are completed it will be but a short time before the average will include every man with an annual income of $1,500 or better. If the demand continues as heavy in the next two years as it is at the present time it will make necessary the doubling of present plant capacities to keep pace with it."

NEW HOMECOURT PLANT

Notable Plate Mills Rising from the Debris of German Destruction

The new steel plant which is rising from the debris of the former Homécourt works of the Compagnie des Forges & Aciéries de la Marine and d'Homécourt (Cie de Saint-Chamond), situated in the department of Meurthe-et-Moselle, will be conspicuous for the scope and scale of the plate-making capacity. Since the conclusion of the armistice the company has occupied itself with the problems of restoration, and some particulars of the program have been received from Captain Delporte of the company.

It will be recalled that this plant fell into the hands of the Germans in the first days of the war, and it was not freed and returned to the owners until Nov. 11, 1918, the day of the signing of the armistice. What was the result of the German occupation has already been discussed in these columns, particularly in the issue of June 5, 1919, in which we gave illustrations of different departments of the works as they existed before the war and as they were found on the cessation of hostilities.

At the moment of the declaration of war the plant, which was in full activity, comprised in the main the following: Seven blast furnaces equipped with mechanical charging apparatus and modern blowing engines; a Bessemer steel plant with four converters of 17 tons capacity each; an open-hearth plant with two modern furnaces of 40 tons capacity each; a rolling mill with two blooming mills, one of 850 mm. (33½ in.) and the other of 635 mm. (25 in.), a universal mill for heavy plates and another plate mill; central power station with gas engine driven generators; a plant for dephosphorizing slag, and storage space for manufactured products. Situated in the center of the production of the minette ores of Lorraine (the mine openings being substantially at the feet of the blast furnaces), provided with modern equipment, the Homécourt works was one of the most powerful French steel plants. Its annual production of Thomas iron was about 420,000 tons.

Of the seven blast furnaces nothing remained except shells; all the blowing engines, the charging apparatus and piping had been torn down, carried away or smashed. The metal framework of the Bessemer plant, much deteriorated, remained. Inside everything had been destroyed by dynamite. The building of the open-hearth plant and the furnaces had been destroyed, and the traveling cranes, the gas producers and the machinery had been taken down and transported into Germany. The building housing the rolling mill was substantially intact, but the interior presented an aspect of veritable devastation; all rolling mills and driving machinery had been broken up on the place. Three of the prime movers of the central power station had been broken up, while two others and all the piping systems had been carried away. There was naturally nothing remaining in the storage yard.

Captain Delporte says that the Germans were particularly embittered against the Homécourt works because, as they said openly, "the company to which these works belonged has devoted itself with so much success in its works at Saint-Chamond to the products of French national defense." They knew that it was these works from which went out to the war the chief inventions in modern artillery, guns of large caliber, tanks and caterpillar carriages.

The Iron and Steel Furnaces

The program of reconstruction comprehends the following: Seven blast furnaces which will be enlarged as they arrive at the end of their campaigns to increase their unit production from 200 tons to 250 tons per day. Furnaces Nos. 1 and 2 are already in the course of transformation. They will be completed with coke and ore storage under what is called the American system with traveling cranes and the like, and each furnace will have an inclined skip hoist. The equipment includes 29 Cowper hot stoves and one turbo blower of 2000 hp. rating, two gas driven blowing units of 2000 hp. and five gas blowing units of 2400 hp. The annual production of pig iron of the seven furnaces will be about 550,000 tons.

The Bessemer steel plant will include two 800-ton mixers, four 25-ton converters with space for a fifth, two cupolas for making spiegeleisen; 22 lime pits of 1400 tons total capacity, a dolomite shop with two cupolas, two gas blowing units of 6000 hp. and a hydraulic plant including three high pressure pumps of 2 cu. m. per minute capacity at 50 kg. pressure (530 gal. at 700 lb. per sq. in.. The annual production of Bessemer steel will be 470,000 tons.

The open-hearth plant will include four 35 to 40-ton furnaces, of which three are in operation. Waste heat boilers form a part of the equipment. The annual capacity of open-hearth steel will be 110,000 tons.

An electric steel plant will be included with three furnaces of 25 to 30 tons capacity, and the plant will be capable of producing about 120,000 tons of quality steel, taking molten Bessemer steel.

Plate and Other Rolling Equipment

The rolling mill equipment will comprehend:

1 blooming mill of 1.1 m. (43.3 in.) for ingots of 4 tons.

1 American blooming mill of 1.118 m. (44 in.) for ingots of 10 tons.

1 Morgan continuous billet mill with 4 stands in tandem of 535 mm. (21 in.) and 6 stands in tandem of 455 mm. (17.9 in.).

1 reversible plate mill of 4.5 m. x 1.25 m. (177 x 49 in.), capable of taking 30-ton ingots.

1 three-high plate mill of 3.3 m. x 950 mm. (130 x 37.5 in.).

1 three-high plate mill of 2.2 m. x 750 mm. (86.5 x 29.5 in.), but arranged also for a two-high stand 1.5 m. x 700 mm. (59 x 27.5 in.) for plates up to 0.12 in. and checkered plates.

1 two-high universal American plate mill of 363 mm. (14.3 in.) for plates up to 1.22 m. (48 in.) in width, this mill capable of being changed to an ordinary plate mill by removal of the vertical rolls.

The mill equipment also includes two batteries of pit furnaces not heated and four heated. The heating will be a gas mixture from the blast furnaces and coke ovens.

The annual production will be about 250,000 to 300,000 tons of blooms and billets, and 200,000 to 250,000 tons of plates.

The total of the prime movers in the central station is 38,500 hp. as follows: Four gas driven generators of 1500 hp., two such units of 2000 hp., three units of 6000 hp., a Diesel engine unit of 1500 hp. and three turbo alternators of 3000 hp. The output is three-phase current at 3000 volts and 50 cycles.

A battery of 30 boilers heated by blast furnace gas, or as needed by heavy oil or coal, will maintain pressure as an auxiliary. The operation of the works is based in a unique fashion upon the use of blast furnace gas for power and upon a mixture of the blast furnace gas and that of the coke ovens for heating the furnaces. Several batteries of gas producers will serve as an auxiliary or lie in reserve.

The coke ovens are 280 in number, grouped in four batteries with a plant for recovery of the by-products and the distillation of benzol. These furnaces lie parallel to and behind the line of blast furnaces. The total production will be about 1500 tons per day. The ovens will be supplied with coal from mines which the company acquired before the war. They will be heated by gas from the blast furnaces.

Shops for dephosphorization of the slag will have an annual production of 140,000 tons.

Seth A. Moulton, vice-president and managing engineer, Industrial Furnace Corporation, spoke before the Boston Chapter, American Steel Treaters' Society, Tuesday evening, March 9, at the Engineers' Club, Boston, on the selection of furnaces. Mr. Moulton is in a position to present an impartial view of this important problem, which he did, and was able to offer valuable suggestions, both in his address and in the general discussion which followed.

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The Rights of the Public

The paramount interest of the public in industrial affairs is being emphasized by impartial bodies and opposed by partisans of the labor unions. Labor leaders recently protested vigorously against the wage adjustment section of the railroad bill passed by Congress, particularly against the provision as to the personnel of the railroad labor board, which is to be made up of three representatives of the carriers, three of the employees and three of the public. The representation given the public was a matter for special objection by the labor union representatives.

President Wilson, in indorsing that provision of the bill, has given an impetus to the movement for the recognition of the public in the settlement of wage disputes, which has been gaining strength during recent months. In his letter to the chiefs of the railroad labor unions the President frankly said that he could not share the apprehension felt by them as to the provisions of the bill concerning the labor board. He said he believed that these provisions were appropriate in the interest, not only of the public, but also of the railroad employees. He added that the public representatives would not be against wage increases merely because they involved rate increase. The President expressed the hope that the putting into effect of these provisions, with a carefully selected labor board whose public representatives can be relied upon to be fair to labor, will mark the beginning of a new era of better understanding between the railroad managements and their employees. We are glad to note that labor leaders finally decided to accept the labor provisions of the railroad law and do the best they can under it.

The declaration of principles which has just been adopted by the committee on labor relations in the Cleveland Chamber of Commerce is notable for the emphasis which it places on the rights of the public. It declares that public interest is paramount and demands that justice be done to all. "The employees' right to strike and the employer's right to lock out his employees," says the committee, "are both secondary to the public's right to service. Since public interest is paramount, it follows that public opinion is and should be a potent influence for the settlement of labor disputes." Therefore the committee advocates that machinery be set up to develop and crystallize public opinion according to established facts.

The provisions of the new railroad law and such declarations as that of the Cleveland committee will do much to arouse public sentiment along the right lines and make it increasingly difficult for either employers or employees to disregard the rights of the public.

Dividends and Labor Turnover

In a competitive market, the manufacturer with the lowest labor turnover will as a rule have a distinct advantage in cost. The reasons for this are not hard to find. A new employee is unfamiliar with his work; therefore, for an appreciable length of time, he cannot turn out as much product as an older employee of equal or even less skill. There is a double loss here. First, there is the increased cost of production due to the excessive overhead cost carried by each item produced, which excessive overhead will continue until the worker's output reaches the same standard as the older employee's. Second, there is the loss of profits on the work of the employee, which may be measured by the difference in his output and that of the older employee. There is also often an additional loss due to greater spoilage.

High labor turnover affects profits in another way. It puts on the foremen and supervisors a heavy burden in instructing the newcomers and watching their work. This necessarily distracts their attention from their proper function of supervising all of their men and keeping their respective departments keyed to top-notch efficiency. High labor turnover hits at profits all along the line.

What are the causes of high labor turnover? Sometimes they are obscure, but more often, to the trained observer, they are glaringly apparent. Bad working conditions or an unsatisfactory wage scale are among the most prolific causes. Ignorant or overbearing foremen frequently cause an excessive number of workers to quit. If the work is hard or disagreeable and other factories

in the vicinity offer easier or more agreeable jobs it is hard to hold the operating force.

But there is hardly any cause of a high labor turnover that cannot be remedied. Bad working conditions include poor lighting, heating and ventilation. Workers will abandon shops which have any or all of these conditions for those that have good light, sufficient heat and adequate ventilation. Heavy lifting and carrying can be obviated by providing suitable transportation facilities. Dangerous machinery can be safeguarded. Exposure to excessive heat or fumes can be cured by ventilation. These are engineering problems and, to the engineer, easy to solve. Unsatisfactory wage scales can be adjusted or the system of wage payment so changed that the workers can earn more than is possible in nearby factories. If the wage problem is properly attacked, an increase in the worker's earnings need not increase costs but may actually decrease them. Foremen who antagonize their men can be disciplined or removed.

What does high labor turnover mean when measured in actual production? A plant that now comes to mind had an average labor turnover of 27 per cent per month. On plotting the production and the turnover it was found that the volume of the product rose and fell with the stability of the labor force. The average value of the product in this case was only one-half of the actual capacity of the plant, and the plant was far behind its orders. There were some other contributing causes, of course, but the investigation showed that the high labor turnover was chiefly responsible.

Now take a look at a picture of another sort. A concern in an industry where the average labor turnover is 225 per cent per year, has reduced its labor turnover to an average of 9 per cent in three years. The profits of this company have increased in direct proportion to the decrease in labor turnover, the quality of its goods is higher, its deliveries to customers are made when promised, and labor troubles are unknown. Its costs are lower and its wages are higher than those of its competitors.

What this manufacturer has done other manufacturers can do. When the labor turnover exceeds 10 per cent, an outlay for expert investigation and the devising of means to reduce it would appear advisable.

Evidence that British iron and steel exports are gradually recovering is afforded by the official data for January, just issued, and analyzed elsewhere in this issue. It is necessary to go back to the middle of 1917 to find a month in which these exports exceeded those for January this year. In July, 1917, the total was 268,190 tons; that for January, 1920, was 261,248 tons. The average per month for 1917, 1918 and 1919 was well below 200,000 tons. Since October last year, the upward trend has been slow but steady. The increase in January this year over the monthly average in 1919 has been most pronounced in galvanized sheets, steel bars, tin plates and pig iron, and in the case of steel plates, bars and black sheets the January exports exceeded even the monthly averages of the record year 1913. There are signs of industrial improvement in Great Britain.

Steel Exports in 1919

An analysis of the 1919 iron and steel exports of the United States brings out two important facts: First, the total of 4,386,200 gross tons, while only 70 per cent of the peak of the war exports in 1917 was over 50 per cent larger than the pre-war records in 1912 and 1913; second, in several important products the exports last year exceeded any previous record, either of war or peace-time. It was not to be expected that last year's exports would approach the enormous shipments during the height of the war, swelled by munitions of all kinds. An interesting fact in this connection, however, is that, leaving out of consideration the more than 2,000,000 tons of steel billets, ingots and blooms exported in 1917, the 1919 and 1917 totals would have been approximately the same. Even last year foreign demand for such semi-finished steel was heavy, shipments having been 258,400 tons, as contrasted with only 91,800 tons in 1913. In 1917 these exports reached 2,013,400 tons.

The 1919 foreign movement in four prominent products exceeded not only any pre-war exports but any record made during the war. These products were rails, plates, sheets and tin and terne plate. Rail exports reached a total of 652,400 tons last year, compared with 510,439 tons in 1917 and 460,553 tons in 1913. Japan was the largest buyer, with France second. In 1913 Canada was the predominant buyer. The steel plate movement, easily the feature of last year's exports, reached a total of over 710,000 tons, against 530,800 tons in 1917. Thus the 1919 shipments were over three times any pre-war exports, the 1913 total having been only 223,800 tons. Here, again, Japan was the leading consumer last year, taking over one-third of the total. Almost equally noteworthy has been the tin-plate export expansion. In 1919, at 204,500 tons, these exports were nearly four times those for 1913, which were 57,800 tons. In 1917 tin-plate shipments were 188,600 tons. Japan is first and Canada second as a buyer of this product last year. Foreign demand for steel sheets has also expanded beyond previous records, having been 177,400 tons last year, against 157,300 tons in 1917 and 140,600 tons in 1913.

Prominent among the products for which foreign demand in 1919 was far in excess of pre-war exports are: Steel bars, wire other than barbed, railroad spikes and cast and wrought pipes and fittings. The steel bar exports last year were 534,200 tons, against 211,700 tons in 1913. The movement of structural steel in 1919 amounted to 360,700 tons; it was 296,900 tons in 1917 and 403,200 tons in 1913. France ranked second as buyer of such material last year, with Canada first and Japan third.

In values the 1919 exports were about three and one-half times those of 1913, or $969,273,732 against $293,934,160. The high record was $1,241,960,102 in 1917.

There should be no hasty drawing of conclu-

sions from these data or making of predictions as to the future. It seems certain, however, that with proper co-operation between capital and labor and normal efficiency on the part of labor, foreign demand for American steel for a number of years will well exceed that of pre-war time. The slow recuperation of European producers will be no inconsiderable factor in itself.

Steel for Australia

Australia, which before the war imported most of the steel it required, will be able soon, or at least when normal labor conditions return, to meet some of its needs from its own plants. Unable to obtain such products from Great Britain during the war, Australia turned to the United States for steel, and at the same time increased its own producing capacity under the stimulus of import duties and bounties. In several commodities exports from the United States to Australia in 1919 largely increased over those for previous periods. The shipments of galvanized sheets were three and one-half times those for 1917, and of steel plates and sheets Australia took from us in 1919 nearly twice the quantity bought in 1917. The buying of American metal-working machinery has been heavier recently than in any previous period.

While locomotives have been built in Australia for some time, it has been necessary to import certain parts such as wheels, tires, axles, etc., but now the Commonwealth Steel Product Co. is building a plant there which will produce all these. Galvanized iron and black sheets are soon to be manufactured by a branch plant of John Lysaght, Ltd., the well known British producer, a bonus having been granted by the Australian Government. Wire is to be produced by the Austral Nail Co. (which will secure rods from the Broken Hill Proprietary Co.), and the Broken Hill company is planning to produce tin plate, the need for which during the war caused so much suffering. The Broken Hill interest will also soon be in a position, in conjunction with another company, to meet the entire Australian needs of rails, ship plates and some other products. Rail imports from the United States have ceased already; very few are now imported from Great Britain. An interesting development is the standardization of structural sections so that the entire domestic requirements can be met by Australian mills. The increase of existing duties on iron and steel imports is also under consideration.

In 1913 Australia imported nearly 400,000 tons of British iron and steel, so far as classified data inform us, but in 1919 the total was only about 91,000 tons. The American steel exports to Australia in 1919 were about 53,000 tons. From an insignificant producer of steel only a few years ago, Australia may yet rank well up among the smaller producing countries. This will not be possible, however, until labor conditions are better and the workman co-operates with the employer. In that event both Great Britain and the United States will lose an important customer for some products.

Foreign Buyers Bidding High in Belgium

BRUSSELS, BELGIUM, Feb. 19.—Exchange against Belgium has been translated into a new advance in semi-finished steel and also in finished products. In spite of the difficulties of the hour, we found the means of exporting in 1919 10,000 tons of pig iron, 9,000 tons of structural shapes, 75,000 tons of merchant bars, 16,000 tons of rods and nearly 27,000 tons of plates.

The situation is aggravated by the competition from the neutral countries. Some fear is developing that the market has been moving too fast. The buyers on export account are bidding 1.50 fr. per kilo for bar iron (5¼c. per lb. with exchange at 13 fr. per dollar). Steel bars are put a little lower. As to plates, they seem also to be valued at 1.5 fr. per kilo.

It appears that the budget for the purchase of cars for Belgium provides for 300,000,000 to 350,000,000 fr. At the outset, the Belgian railroads count on ordering 5,000 cars in Canada, 5,000 in the United States and 5,000 in England. This would leave 3,000 of one type and 800 box cars for Belgian builders. It is stated that American makers impose the payment of interest in dollars at 11.20 fr. per dollar, which corresponds to an interest rate of 12 to 13 per cent, and this is regarded as very onerous.

Tungsten Bill Held Up

WASHINGTON, March 9.—Secretary of the Navy Daniels has held up action temporarily on the bill providing duties on imports of tungsten as a means of protection to the domestic industry. In a letter to the Senate Finance Committee, Secretary Daniels indicates his belief that the proposed duties on tungsten might increase the cost to the Navy of high-speed steel. Representative Timberlake, of Colorado, author of the bill, has replied to Secretary Daniels, contending that the proposed duty would not cause a material increase in the price of steel, but as a means of developing domestic industry in order to be independent of other nations in times of emergency, it would justify the slight increase in the cost of the finished steel. This statement by Mr. Timberlake has been referred to Secretary Daniels, and pending a reply from him the Senate Finance Committee has postponed action on the bill. The measure passed the House several months ago and has already been approved by the sub-committee of the Senate Finance Committee.

Coke Production Increases

WASHINGTON, March 9.—Production of beehive coke increased during the week ended Feb. 28, according to the report of the Geological Survey. The preliminary estimate of production for the week is 433,000 tons, an increase of 1.4 per cent over the preceding week and a cumulative production during the 51 working days of 1920 of 3,707,000 tons, a decrease of 12.7 per cent when compared with last year.

With respect to bituminous coal production, the weekly report indicates a partial recovery from the decline of the preceding week. The returns so far received point to a total output for the week ending Feb. 28, of approximately 10,230,000 net tons. This was an increase of 719,000 tons or 7.6 per cent as compared with 9,511,000 tons produced during the previous week.

Favors Protective Tariff

Advocating a protective tariff for the iron and steel industry, the Swedish Iron and Steel Trade Association has applied to the Swedish Government to make an inquiry. The association complains that although there is no cheap steel obtainable at present in America, England or Germany, Swedish purchasers have been holding up orders in the hope that a fall in prices would enable them to import steel cheaper than the native product. The association claims that when freight rates decline and England and Germany have a surplus, the domestic product will encounter strong competition.

A Directory of Plant and Other Special Libraries

Readers of THE IRON AGE are asked to assist the Special Libraries Association by sending data to it concerning plant or other special libraries maintained by individual companies or joint libraries supported by the co-operation of several companies. Frequently during the war army men could have used a directory of institutions or corporations having special information which was then in demand, but no such list was in existence. It is now proposed to supply this want. A special library has been defined thus:

A good working collection of information either upon a specific subject or field of activity; it may consist of general or even limited material serving the interests of a special clientele; and preferably in charge of a specialist trained in the use and application of the particular material.

Readers who can respond with information on this subject are asked to give information as follows:

1. Name of institution or company. 2. Name by which library is known. 3. Name of librarian or custodian. 4. Can it be classified as any of the following: financial, business, legal, engineering or technical, institutional, municipal, reference, agricultural? 5. If not, how can it be classified. 6. Does it serve a special clientele? 7. Would your librarian be willing to assist other special libraries to a reasonable extent?

The above data should be sent to William F. Jacob, chairman library census committee, care General Electric Co., Schenectady, N. Y., who will be glad to answer any questions.

A Spelter Contract of 1915

A judgment of $9,555 and costs was granted March 4, by Chicago courts to Edward Le Bas & Co., London, dealers in iron, steel and other metals, against the Sandoval Zinc Co., Chicago, for failure to deliver a quantity of spelter ordered in March, 1915, for delivery in the following month. With the market quoted at 9.29c. per lb., New York, Edward Le Bas & Co. ordered 100 gross tons of 98 per cent spelter, at the same time opening a credit with Brown Brothers & Co., New York bankers. The latter notified the Sandoval Zinc Co. of the credit and awaited instructions. The following month, April, spelter advanced to 11.22c. per lb., New York. After giving the order, Edward Le Bas & Co. proceeded to sell a large part of the purchase to English clients. Later they wrote the Sandoval company concerning shipments and were informed that the order had never been received. The English company was then forced to cancel contracts with its customers at a considerable loss. In May, 1919, F. W. Hall, head of Edward Le Bas & Co., Inc., New York, established in 1917 and controlled by the British company, instituted a suit for damages which resulted as stated above, the court sustaining the contention that the goods had been properly ordered.

National Tube Co.'s Proposed Plant at Gary

The report that the National Tube Co., Pittsburgh, would start work shortly upon the building of new blast furnaces, Bessemer steel works, and pipe and tube mills at Gary, Ind., are authoritatively denied. Early in 1916 the company had under consideration the building of a new plant near the works of the Indiana Steel Co., at which pipe would be manufactured and all processes carried out from the ore to the finished product. The plans contemplated ore docks to be equipped with the most modern unloading machinery, also yard for the storage of ore. Four blast furnaces were provided for, also a Bessemer steel plant and all auxiliary mills for the making of pipe. However, the demand for war essentials and later the entrance of this country into the war made necessary the abandonment of the project. It has not been actively taken up since the war and probably will not be for some time. In the statement of new construction contemplated or under way, which was made by the Steel Corporation at the beginning of 1920, the following reference is made to the Gary project: "Gary tube plant: self-contained tube plant, including four blast furnaces."

CONTENTS

Receivers for Engineering Corporation

William L. Dollier and F. Clyde Sullivan were named as receivers of the United States & Cuban Allied Works Engineering Corporation of Havana, Cuba, New York and Bradford, Pa., in an order handed down in United States District Court at Pittsburgh on Monday, March 8. The order of court followed the filing of a suit by Stephen Balkwill and George Balkwill, copartners in the Cleveland Steel Casting Co. of Cleveland. The court order places the receivers under bond of $25,000 each and authorizes them to operate the Bradford plant and to borrow money to meet the payroll of the plant. The plaintiffs in the action claim that the defendant company is indebted to them in the sum of $8,454 and allege that the defendant concern owes debts aggregating $200,000 to themselves and others. The creditors bill sets forth that the authorized capital stock of the company is $5,000,000 and that the outstanding stock is worth $3,494,676.

Iron and Steel Markets

EASIER CONDITIONS

Some Railroad and Automobile Buying

Signs of the Peak in Pig Iron Prices — More Rails at $57

With production at the highest rate in more than a year and the prospect of further increase as spring comes on, the steel trade expects gradually to work out of the serious hamperings of recent weeks. There has been no rush thus far on the part of the railroads to buy equipment, and the week has rather added to the evidence that the strained conditions in the industry are yielding.

Some of the steel that will be applied to railroad needs was apparently reserved in anticipation of the return of the roads, and the mills that have been able to get the highest prices for their output will probably not figure largely in the equipment tonnage.

A development of interest in the wire trade is the taking of orders by a large producer with the stipulation that the price will be that prevailing at the time of delivery, indicating the abandonment of the low prices of March 21 on wire products.

In the automobile trade efforts to secure steel for the second half of the year have led likewise to agreements to pay prices ruling when deliveries are made, a considerable tonnage of sheets apparently being provided for in this way. Automobile manufacturers have cared little what they have paid for early delivery steel, as high as $90 being reported for sheet bars which in turn they have had rolled into sheets for car bodies. At the same time a sale of sheet bars is reported in the Chicago district at $70.

Locomotives bought since the first of the year and those now under negotiation, including 280 for the New York Central, 100 for the St. Paul and nearly as many for the Illinois Central are upward of 1200. Inquiries for about 11,000 more cars (including car repairs) have taken definite form, making more than 25,000 for early contracting.

In the week's lettings of 30,000 tons of fabricated steel work nothing was for apartment houses. A small part was railroad bridge work, but industrial plants and business buildings predominated.

More open-hearth rails have been sold at $57, or $10 above the Steel Corporation's price, two recent contracts being for 10,000 and 25,000 tons. The sale of plates, shapes and bars by one interest at 4c. for second quarter delivery has resulted in considerable bookings. There are also reports of bar sales at 3c. and 3.5c., Pittsburgh.

The continued offering of portions of the 300,000 tons of plates and structural shapes bought some weeks ago by dealers from the Emergency Fleet Corporation has tended to check buying from the mills for shipyard account, the prices on the resale steel being below those of independent mills.

Some axle makers are concerned with prices, now that business is piling up. They face $60 to $70 billets and get no more for their product than in the early weeks of 1919, or 3.65c. per lb. If demand mounts up sufficiently an advance of $5 to $7 will probably be asked.

The activity on this side of the line will not make for ready shipment of material should it be needed, to Canadian builders who have booked 112 locomotives and over 5250 cars. And what with duty, war tax on imports and adverse exchange, Canada would have to pay in excess of $1.60 for every dollar's worth of American axles. Part of the Grand Trunk's needs, for lines within the United States, may come to domestic mills.

Further signs appear of the reaching of the peak in pig iron prices. Some resale basic has figured in the Pittsburgh district, where weakness in such iron continues, and an inquiry for 15,000 tons by a St. Louis user of basic developed as low as $38 in the South, causing the withdrawal of the business. An effort to advance foundry iron in eastern Pennsylvania to $45 did not succeed and foundry iron is still available at $40, Birmingham. A large furnace interest in southern Ohio sold 25,000 tons in the week for delivery during the second half of the year at $42, furnace. There is much more inquiry for pig iron for export, owing to the fact that it can be shipped to England for ballast with cotton at considerably less than recent freight rates and there is a chance of a fair movement should the exchange situation continue to improve.

Exports of iron and steel in January were heavier than in December—360,000 tons against 254,000 tons. A considerable part of the movement, however, was to Japan and other countries not affected by adverse exchange conditions.

British steel prices have advanced £1 and £2. In terms of the somewhat higher exchange on London, ship plates range from 4c to 4.60c per pound, beams from 3.50c to 4.35c, bars from 3.90c to 4.75c and rails from $75 to $80.50 per ton. Large contracts between shipyards and plate and structural mills have been the leading feature in the British market. Germany's position is but little improved and pessimism as to that country's iron and steel trade has been growing.

Pittsburgh

PITTSBURGH, March 9.

R. W. Gardiner, commissioner of the Pittsburgh Coal Producers' Association, estimates the loss of output of coal in the Pittsburgh district in February as 1,200,000 tons from shortage in cars, 144,700 tons from labor shortage, and 40,400 tons from mechanical troubles, a total of 1,447,100 tons. Commissioner Gardiner says that the railroad situation is no better and the car supply is about 40 per cent of normal. Attempts are now being made to load cars in the direction of the home road, so that cars belonging to each railroad will be on their own rails as soon as possible. The monthly output of coal of the Pittsburgh Coal Co., under normal conditions is 2,000,000 tons, and this concern needs to move this output about 1000 cars a day. At present it is not mining more than 1,000,000 tons per month, and is not getting more than 300 or 400 cars per day, and in one day recently it secured only 171 cars. Delivery of coal and coke to the blast furnaces and mills in the Pittsburgh and Valley districts is no better, nor is the supply of cars any larger. At some blast furnaces, more cars are being received for loading, but

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 9, 1920	Mar. 2, 1920	Feb. 10, 1920	Mar. 11, 1919
No. 2 X, Phiadelphia‡	$45.35	$45.35	$45.35	$36.15
No. 2, Valley furnace†	41.00	41.00	42.00	28.00
No. 2 Southern, Cin'ti†	43.60	43.60	43.60	34.60
No. 2, Birmingham, Ala.†	40.00	40.00	40.00	29.00
No. 2, furnace, Chicago*	43.00	43.00	43.00	31.00
Basic, del'd, eastern Pa.	43.40	43.40	41.40	33.90
Basic, Valley furnace	*41.00*	41.50	43.00	30.00
Bessemer, Pittsburgh	43.40	43.40	42.40	33.60
Malleable, Chicago*	43.00	43.00	43.50	31.50
Malleable, Valley	42.00	42.00	43.00	31.50
Gray forge, Pittsburgh	42.40	42.40	42.40	31.40
L. S. charcoal, Chicago	57.50	57.50	57.50	38.85
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$45.00	$45.00	$45.00	$55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	60.00	60.00	52.50	43.50
O.-h. billets, Pittsburgh	60.00	60.00	52.50	43.50
O.-h. sheet bars, P'gh	65.00	65.00	58.00	47.00
Forging billets, base, P'gh.	80.00	80.00	75.00	56.00
O.-h. billets, Philadelphia	64.10	64.10	59.10	47.50
Wire rods, Pittsburgh	70.00	70.00	65.00	57.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	4.25	4.25	4.25	3.145
Iron bars, Pittsburgh	4.25	4.25	4.00	2.90
Iron bars, Chicago	3.50	3.50	3.50	2.92
Steel bars, Pittsburgh	3.50	3.50	3.00	2.70
Steel bars, New York	3.77	3.77	3.27	2.97
Tank plates, Pittsburgh	3.50	3.50	3.50	3.00
Tank plates, New York	3.77	3.77	3.77	3.17
Beams, etc., Pittsburgh	3.00	3.00	2.70	2.80
Beams, etc., New York	3.27	3.27	2.97	3.07
Skelp, grooved steel, P'gh.	2.75	2.75	2.45	2.70
Skelp, sheared steel, P'gh.	3.00	3.00	2.65	3.00
Steel hoops, Pittsburgh	4.00	4.00	3.50	3.30

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Mar. 9, 1920 Cents	Mar. 2, 1920 Cents	Feb. 10, 1920 Cents	Mar. 11, 1919 Cents
Sheets, black, No. 28, P'gh.	5.50	5.50	5.00	4.70
Sheets, galv., No. 28, P'gh.	7.00	7.00	6.50	6.05
Sheets, blue an'l'd, 9 & 10	4.50	4.50	4.25	3.90
Wire nails, Pittsburgh	4.00	4.00	4.50	3.50
Plain wire, Pittsburgh	3.50	3.50	3.50	3.25
Barbed wire, galv., P'gh.	4.45	4.45	4.45	4.35
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.35
Old Material, Per Gross Ton:				
Carwheels, Chicago	**$35.00**	$34.50	$39.00	$21.00
Carwheels, Philadelphia	42.50	42.50	40.00	23.00
Heavy steel scrap, P'gh.	27.00	27.00	28.00	14.00
Heavy steel scrap, Phila.	25.50	25.50	26.00	13.75
Heavy steel scrap, Ch'go.	23.50	23.50	25.00	15.00
No. 1 cast, Pittsburgh	34.00	34.00	34.00	18.00
No. 1 cast, Philadelphia	40.00	40.00	40.00	21.00
No. 1 cast, Ch'go (net ton)	37.50	37.50	39.50	21.00
No. 1 RR. wrot., Phila.	36.50	36.50	36.00	20.00
No. 1 RR. wrot., Ch'go (net)	26.00	26.00	26.50	15.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$6.00	$6.00	$6.00	$4.00
Furnace coke, future	6.00	6.00	6.00	5.00
Foundry coke, prompt	7.00	7.00	7.00	5.00
Foundry coke, future	7.00	7.00	7.00	5.50
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*18.50*	18.75	19.25	15.75
Electrolytic copper, N. Y.	*18.37½*	18.75	19.00	15.00
Spelter, St. Louis	*8.60*	8.75	8.65	6.15
Spelter, New York	*8.95*	9.10	9.00	6.50
Lead, St. Louis	**9.15**	9.00	8.50	5.00
Lead, New York	**9.50**	9.25	8.75	5.25
Tin, New York	*60.25*	63.25	58.00	72.50
Antimony (Asiatic), N. Y.	**12.00**	11.87½	11.50	7.00

there is a scarcity of men for this purpose, and shipments of pig iron are very slow.

Sentiment in the local steel trade is better than a week ago, due largely to the Steel Corporation decision, and later to the Supreme Court decision that stock dividends are not taxable. This latter decision means that likely in the near future some local manufacturing concerns will declare stock dividends and it is probable that some of the larger Youngstown steel companies will also declare heavy stock dividends, notably the Youngstown Sheet & Tube Co. However, the feeling is becoming general that the crest in prices in iron and steel has been reached, with the possible exception of sheet bars, for which almost unbelievable prices have been paid recently by three or four leading automobile makers, who make conversion contracts to have these bars rolled into sheets. The weather for the past two or three days has been very pleasant, and it is believed that two or three weeks of good weather would materially improve the car situation, which is about as deplorable as it could possibly get.

Changes in prices in the past week have been unimportant. Basic iron is easier, probably due to offerings of resale iron by dealers, and the scrap market is dull in demand with prices soft. Some consumers in their eagerness to get on the books of the mills are making tenders of business for third quarter and last half delivery, at prices to be fixed by the mills later. In some cases these tenders have been accepted, but as a rule they are turned down, most producers not caring to sell so far ahead, owing to the uncertainty of costs. Some business in tin plate has been done for last half, the price to be named later, and to be that in effect for that delivery. The labor situation is giving some concern, and it is likely that when good weather comes there will be an exodus of labor from the mills to outside jobs. This has always occurred in past years, and this year is not likely to be an exception.

Pig Iron.—The local market is limited in demand, with prices ruling fairly steady, with the exception of basic iron, on which some concessions are offered, mostly by dealers who have some basic iron bought sometime ago which they are now anxious to sell. A local consumer reports that it has had basic iron offered to it by two or three sellers in the past few days at $42, Pittsburgh, this price being equal to $40.60, Valley furnace. A local interest is in the market with an inquiry for 2500 tons of high silicon basic iron, but it is believed this concern will buy some standard basic iron if it can secure it at what it considers the right price. Pressure on the furnaces for deliveries of iron is as strong as ever, but shipments are slow due to shortage of cars and labor. Bessemer iron is quiet, two sales amounting to about 1000 tons being reported in the past week at $42 Valley furnace. We also note a sale of 800 tons of No. 2 foundry iron for April and May at $42 at furnace. Output of pig iron this month is expected to show a large increase over February, especially if there is favorable weather and the fuel supply gets better. The belief is that prices of pig iron have probably reached the crest, but there is some inquiry for last half of the year. A considerable tonnage of basic is reported as sold for last half on the basis of $40 at Valley furnace.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh districts being $1.40 per gross ton:

Basic	$41.00 to $41.50
Bessemer	42.00
Gray forge	41.00 to 42.00
No. 2 foundry	41.00 to 42.00
No. 3 foundry	39.50
Malleable, Valley	42.00 to 43.00

Ferroalloys.—There is still an active inquiry for ferromanganese for last half delivery, the minimum price of 76 to 80 per cent domestic for that delivery being $160 to $165. For prompt delivery there would

be no trouble whatever in getting $200 per ton. There is some demand for 50 per cent ferrosilicon, and a sale of 100 tons is reported for third quarter at about $86 delivered.

We quote 76 to 80 per cent domestic ferromanganese $160 to $165 for second half delivered, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at $85 to $90, and 18 to 22 per cent spiegeleisen at $55 to $57.50, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $56.50; 10 per cent, $59.50; 11 per cent, $62.50; 12 per cent, $66.10. We quote 6 per cent silvery iron, $45.75 to $46.25; 7 per cent, $50 to $50.50; 8 per cent, $52 to $52.50; 9 per cent, $54 to $54.50, and 10 per cent, $56.50 to $57. An advance of $3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of $2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Billets and Sheet Bars.—Sales of several thousand tons of sheet bars have been made by a local interest in the past week at $85 to $90 at mill, and it is claimed that one sale has been made at $93, seller's mill. These bars are being bought by two or three leading automobile makers, who then make contracts for converting these bars into sheets at so much per ton. It is said one local interest has sold 5000 tons or more of sheet bars at the above range in prices, and for the purpose named. Steel mills are very much back in deliveries of billets and sheet bars, but in the past week there has been some improvement in production and shipments, due to favorable weather and a little better supply of empty cars for loading. The present acute shortage in steel is likely to last for some time. The three Youngstown, Ohio, mills that roll sheet bars are badly in need of coal, and their output of bars is very much curtailed. In the prices given below, the lower figures on billets and sheet bars are those of the Carnegie Steel Co. based on the March 21 schedule, while the higher prices are those that have been paid by consumers to get bars and billets.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $38 to $70; 2 x 2-in. billets at $42 to $75; slabs, $41 to $75; sheet bars, $42 to $80, and forging billets, ordinary carbon, $80 base, all f.o.b. mill Pittsburgh or Youngstown.

Structural Material.—Actual contracts placed in the past week were light, but inquiry is still active. The McClintic-Marshall Co. has taken 3000 tons for reconstruction of buildings for the Pittsburgh Plate Glass Co. at Kokomo, Ind. We continue to quote plain material up to 15 in. at 2.45c., this being the price of the Carnegie Steel Co. for very indefinite delivery, while most new sales for reasonably prompt shipment are on the basis of 4c. or higher, at maker's mills.

Plates.—Local steel car companies report a very large number of inquiries pending for all classes of cars, but say that details are not yet ready to give out. Included in the New York Central inquiry for about 13,000 cars are 5500 all-steel box cars, and it is said these will take close to 25,000 tons of blue-annealed sheets, which are likely to be divided among half a dozen or more mills. General demand for plates is abnormally heavy, nearly all mills being filled up for three to six months. It is said Carnegie Steel Co. and Jones & Laughlin Steel Co. are sold up on plates over the entire remainder of this year.

We quote sheared plates of tank quality, ¼ in. and heavier, at 2.65c. to 2.90c. for very indefinite delivery, while prices on ¼-in. and heavier plates, named by mills that will agree to ship out in three or four to six months, range from 4c. to 5c. at mill.

Sheets.—It is said that active inquiries already in the market for cars will require 32,000 tons or more of sheets of various grades, and there may be some trouble in placing this business with the mills, as they are filled up so far ahead. At present the average rate of operations of the independent sheet mills is about 84 per cent, but actual output of sheets is not that large. In spite of the car shortage, shipments of sheets by the independent mills in February were larger than in March. All kinds of high prices continue to be paid for sheets for fairly prompt delivery. A sale of a considerable tonnage of No. 28 galvanized sheets has been made at 9.65c. at mill, this price being $89 per ton above the prices fixed by the March 21 schedule. We also note a sale of 250 tons of No. 28 gage galvanized sheets at 9.35c. at mill. We can also note sales by independent mills of upwards of 10,000 tons of No. 28 gage black sheets at prices ranging from 4.85c. up to 8c. at mill, and sales of Nos. 9 and 10 blue annealed sheets at 4.50c. to 7.50c. at makers' mill. Lately there has been more of a disposition on the part of some sheet mills to sell at slightly lower prices for delivery in two to three months.

We quote No. 28 gage box annealed, one-pass black sheets at 4.35c. to 6.50c.; No. 28 galvanized, 5.70c. to 8.50c., and Nos. 9 and 10 blue annealed at 3.55c. to 6c., the lower prices named being the March 21 schedules, which are still named by the leading interest while the higher prices represent a fair range of quotations by the independent mills.

Tin Plate.—Some mills report the car supply in the past week as having been slightly better. Independent tin plate mills are operating at about 85 per cent capacity, and the American Sheet & Tin Plate Co. at about 90 per cent. Some contracts for tin plate for last half of the year delivery have been taken, the price being left open, and to be that agreed upon later for second half delivery. The impression is strong among some of the independent mills that the prices on tin plate for the second half may be advanced to $7.75 per base box, that having been the price from Nov. 11, 1918, until Jan. 1, 1919. One mill reports it has sold probably 25 per cent of its output for second half, the price to be fixed later. Export inquiry is active, and it is said as high as $10.50 per base box has been offered for prompt tin plate for export shipment.

We now quote tin plate for domestic consumers and indefinite delivery at $7 per base box, wasters $8. to $8.50, and for export $9 to $9.50 per base box, all f.o.b. mill, Pittsburgh.

Wire Rods.—Domestic and export inquiry is very active, but the available supply of rods is limited. A sale of 200 tons of high-carbon rods has been made at $100 at mill. We quote soft Bessemer and open-hearth rods at $70 and high-carbon rods at $75 to $100 at mill, the carbon content determining prices of the latter.

Wire Products.—The mills continue to report a heavy demand for wire nails and wire of all grades, three of the large makers being practically out of the market as sellers, having their output sold up for three to four months. The Cambria Steel Co. has issued a new card of extras on wire nails, the base being $4 per keg, the card being identical with those issued previously by several other mills. Several small wire nail concerns that buy their plain wire in the open market and that are having great trouble in getting it have recently offered heavy premiums to local mills for considerable quantities of plain wire, but the business has been turned down, the mills stating they have no wire to sell.

We quote wire nails at $3.25 base, this being the price of the American Steel & Wire Co. and $4 base on the new card recently issued by four or five of the independent mills. We quote bright basic wire at $3, this being the price of the American Steel & Wire Co., and $3.50, this being the price of most of the independent mills.

Hot-rolled Strip Steel.—Mills are sold up for three to four months and heavy premiums in prices are being offered by consumers for fairly prompt delivery. Prices on hot-rolled strips range from 5c. to 7c. at mill, the lower price being for regular customers for indefinite delivery, while 7c. and up to 8c. are quoted on small lots for fairly prompt shipment.

Cold-rolled Strip Steel.—The demand is very active, and mills are turning orders away on which they cannot make delivery wanted. We quote cold-rolled strips at 7c. to 10c. per lb. at mill, prices depending on the source of the order, the quantity involved and the delivery wanted.

Cold-rolled Steel Bars.—Three local makers say they are sold up as far ahead as they care to sell, and will accept orders only from regular customers and for indefinite shipments. We quote cold-rolled bars at 5c. to 7c. at mill, prices depending on the order, whether from a regular customer and the delivery wanted.

Iron and Steel Bars.—There is an absolute famine in the supply of steel bars, and iron bars are fast getting in the same position. Frequent sales of steel bars have been made at 5c. at mill, for fairly prompt ship-

ment. Mills rolling iron or steel bars are sold up from three to four months, and will accept orders only from regular customers for shipment at convenience of the mill. The Jones & Laughlin Steel Co. and Carnegie Steel Co. are sold up in steel bars over the remainder of this year.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 4c. at mill, prices depending entirely on the buyer and the delivery wanted. The demand for concrete reinforcing steel bars is fairly active and we quote these, when rolled from billets, at 4c. to 4.25c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.25c. to 4.50c., and refined iron bars 4.50c. to 5c. in carloads, f.o.b. mill, Pittsburgh.

Spikes.—The demand for standard railroad spikes has been very heavy over the past three months, and two local makers report they are sold up to July or longer. The Pennsylvania Lines West lately placed about 10,000 kegs and the New York Central about 6000 kegs. The minimum price of local makers on standard railroad spikes is now $4 base, per 100 lb.

We quote standard spikes, ½ to 9/16 in. and larger, $4 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅝ in. and 7/16 in., $4.50; 5/16 in., $5; boat and barge spikes, $4.25, f.o.b. Pittsburgh. Tie plates $3 to $4 per 100 lb.

Nuts, Bolts and Rivets.—Owing to increasing costs of steel and labor, and the additional overhead expense incurred by the shortage of cars, a general advance of prices on nuts, bolts and rivets in the near future is said to be likely. Makers are sold up largely for first half, but shipments are slow, owing to scarcity of cars.

Hoops and Bands.—The demand is heavy, and makers are sold up for some months. The price of the Carnegie Steel Co. on hoops and bands remains at 3.05c. at mill for indefinite delivery, but other makers are quoting hoops and bands at 4.50c. to 5c. base, usual extras, f.o.b. mill.

Boiler Tubes.—The demand for boiler tubes and also for seamless tubes is reported by the mills to be very heavy. The expectation is that large orders for locomotives will be placed shortly by the railroads, and makers of boiler tubes are looking for some heavy orders in the near future. Prices are firm, and discounts on iron and steel tubes are given on page 787.

Iron and Steel Pipe.—Desirable orders for large quantities of pipe for oil and gas lines are going begging, the mills being sold up for months and absolutely refusing to take on any more obligation. The National Tube Co. is turning out at present about 300 miles of 10-in. pipe for shipment into Mexico. Production of tubular goods in the past week is reported larger, due to a better supply of cars at a few mills, and also to a larger output of steel. Discounts on iron and steel pipe are given on page 787.

Coke.—At one or two plants in the Connellsville region, the average supply of cars last week was a little better, but the general average is still very bad. Output of coke last week showed a further falling off, due to shut down of plants for two or three days at a time waiting for cars to make shipments. One leading consumer is paying from $7.75 to $8 per net ton for high grade furnace coke on sliding scale contracts made some time ago. Government prices on coke, which are expected to be in effect to April 30 next, are $6 for spot or future furnace and $7 for spot or future foundry coke, net tons at oven.

Iron and Steel Scrap.—A leading local consumer that recently bought about 25,000 tons of selected heavy steel melting scrap at $29 delivered is now out of the market, while special permits have to be secured from the railroads for shipments to the open-hearth steel plant of another local interest, and in most cases these permits are refused. Very little scrap is moving from dealers to local consumers, the latter evidently being covered for some time ahead, and are out of the market. The scrap of the Pennsylvania Railroad was to have been awarded to successful bidders to-day (Tuesday) but at this writing it is not known whether the scrap was bought by dealers or by consumers direct. In general, the tone of prices on all grades of scrap is weak.

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$27.00 to $27.50
No. 1 cast for steel plants	34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa.; and Pittsburgh	34.00 to 35.00
Compressed steel	23.00 to 23.50
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh district	18.00 to 18.50
Bundled steel stamping	17.00 to 17.50
No. 1 busheling	24.00 to 25.00
Railroad grate bars	28.00 to 29.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	31.00 to 32.00
Railroad malleable	31.00 to 32.00
Iron car axles	38.00 to 39.00
Locomotive axles, steel	33.00 to 34.00
Steel car axles	31.00 to 32.00
Cast iron wheels	41.00 to 42.00
Rolled steel wheels	29.00 to 30.00
Machine-shop turnings	17.50 to 18.00
Sheet bar crop ends (at origin)	30.00 to 30.50
Heavy steel axle turnings	20.00 to 21.00
Heavy breakable cast	33.00 to 34.00
Cast iron borings	19.50 to 20.00
No. 1 railroad wrought	33.00 to 34.00

Superior Steel Corporation Report

The gross sales of the Superior Steel Corporation last year were $1,300,585 smaller than those for 1918, but the company by retrenching in operating expenses cut down the decrease in net earnings to a little more than half a million, $582,957, to be exact. The dividends of the company were reduced so that the surplus at the close of the year was $197,293 larger than that for the previous year, and the earnings on the common shares were practically on a par during 1919 and 1918. The income account of the corporation for 1919 compares as follows:

	1919	1918	1917
Gross sales	$7,661,277	$8,961,862	$10,821,194
Net income	1,356,409	1,939,366	2,784,475
Surplus after charges	816,726	831,504	967,363
Dividends	588,404	800,475	530,332
Surplus	228,322	31,029	437,031

William H. Creahan, general superintendent of the International Steel Pipe Co., announces equipment contracts have been placed for the company's new plant at Cleveland, work on which will start this spring. Mr. Creahan has negotiated contracts for the furnaces, gas producers and other machinery, delivery to be made in June. It is expected production will commence in the summer. The company will have two butt-weld furnaces with a capacity of 200 tons daily; later it is planned to add two butt-weld furnaces. The company owns 1805 ft. frontage along the Erie Railroad in Cleveland. Mr. Creahan was in charge of construction of the tube mills of the Youngstown Sheet & Tube Co. and later was superintendent of the Spang-Chalfant tube mills in Pittsburgh.

The Columbiana Foundry Co., Columbiana, Ohio, has let the contract for the construction of a new foundry at McKeesport, Pa., to produce gray iron, semi-steel and brass castings. The plant will consist of one all-steel building 100 x 300 ft. and a pattern shop and office building 25 x 150 ft. Latest foundry appliances will be installed. The McKeesport plant is tapped by the Baltimore & Ohio main line. An addition has been made to the Columbiana plant which will be used exclusively for production of small special gray iron parts. To finance these extensions the company has increased its capital stock to $150,000.

The booklet annually issued by M. A. Hanna & Co., Cleveland, showing cargo anlayses of Lake Superior iron ore sold by the firm is of unusual interest this year on account of the statistical information given, which includes contract Lake freights, on iron ore from 1891 to 1919, iron ore shipments for the same period, dates of opening and closing navigation, average analyses, and Lake Superior iron ore prices from 1900 to 1919. There is also a supplement giving a table of premiums and penalties on Lake Superior ores.

Chicago

CHICAGO, March 9.

While the recent termination of Government control did not release the flood of orders expected by some, attractive new inquiries for rolling stock are making their appearance and a few additional contracts for cars and locomotives have been closed. The largest new inquiry comes from the Burlington and calls for 1000 freight cars and 40 passenger service cars. The Santa Fe has bought 50 engines and 500 gondola cars. Confidential orders for 1500 freight cars were taken last week by a leading car builder. The decision of the Supreme Court ruling that the properties of the carriers are to be valued at present prices is expected to assist the roads materially in obtaining credit for purchases of needed equipment. Although the railroads are fairly well covered on rails and track supplies, two additional orders for fastenings were recently closed, the Northern Pacific having bought 10,000 kegs of spikes and the Omaha 1500 tons of iron tie plates for which it paid about $70 a ton. The leading interest continues to accept some orders from car builders, having undertaken to furnish about 8000 tons of plates and shapes for the 1500 freight cars mentioned above. The foremost independent also expects to supply material for railroad purposes. Otherwise both producers have little steel to offer, the latter mill now being out of the market on semi-finished as well as finished material. Its books will probably be opened for second half business some time in April.

Noteworthy among recent transactions in this market was the sale of 2000 tons of commercial sheet bars at $70, mill. One of the most interesting developments in the price situation was the abandonment by the leading wire producer of the March 21 quotations. While this interest has not yet made any advances, it is now taking no orders except at prices ruling at time of delivery.

The pig iron market is slow, while scrap is unsteady, wavering between upward and downward influences.

Local jobbers have again raised sheets, their present quotations being 5.77c. for blue annealed, 7c. for black and 8.50c. for galvanized. Although this advance was not participated in by the warehouse of the leading interest, it has no sheets in stock. The latter warehouse, however, is still offering bars, shapes and plates at ½c. below the prices asked by the other jobbers. Both the leading interest and foremost independent are now operating at about 85 per cent of finishing capacity. This represents an improvement of about 10 per cent for the latter mill. The situation with the larger producer is, however, unchanged and the outlook for the immediate future is none too good, as considerable fuel in transit has been commandeered by the railroads.

Pig Iron.—The market is slower than a few weeks ago, but is not without activity. The largest order of recent date calls for 10,000 tons of Northern foundry and malleable for last half delivery. A local melter is inquiring for 2000 tons of foundry and 1000 tons of malleable for second half shipment, and another interest wants 600 tons of No. 2 foundry for the same delivery. On the whole, however, there are fewer inquiries than a fortnight ago, but present indications point to a resumption of activity, it being generally felt that the market has a firmer tone than a week ago. At that time a St. Louis interest issued an inquiry for 15,000 tons of basic and after sellers cut their prices from $42, Birmingham, to $38, withdrew from the market. While this incident indicates weakness, the prospect of large railroad purchases added to the present large bookings of foundries has given sellers renewed confidence in the stability of present prices. Another indication of strength is the fact that the leading Northern producer has committed most of its last half output. The shortage of coke is a source of considerable concern to a number of Michigan foundries; in fact, they have sent representatives to the ovens to trace shipments. Within the past week several thousand tons of Connellsville coke were sold in this district and Ohio on the basis of $10.50, oven, in case Government restrictions on price are cancelled before date of shipment. Copper free low phosphorus is now firm at $51, Ohio furnace. The Milwaukee producer of low phosphorus will resume operation about April 1, after a long period of inactivity. The stack will alternate on copper free low phosphorus and malleable. The Zenith furnace, Duluth, resumed operation to-day.

The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, average, sil. 1.50 (other grades subject to usual differentials), delivered at Chicago.	$57.50 to $60.50
Northern coke No. 1, sil. 2.25 to 2.75	45.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25	43.00
Northern high phos. foundry	43.00
Southern coke No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25	48.20 to 50.20
Southern coke, No. 2 foundry, sil. 2.25 to 2.75	46.70 to 48.70
Southern foundry, sil. 1.75 to 2.25	45.00 to 47.00
Malleable, not over 2.25 sil.	43.50
Basic	42.00
Low phos. (copper free)	51.00
Silvery, 7 per cent	56.40 to 56.80

Ferroalloys.—Ferromanganese is strong, recent sales of spot material having brought $235, delivered.

We quote 76 to 80 per cent ferromanganese, prompt shipment, $235; 50 per cent ferrosilicon at $85 delivered; spiegeleisen, 18 to 22 per cent, $60 furnace.

Railroad Rolling Stock.—Although the flood of orders which was expected to follow the termination of Government control has not materialized, several new inquiries for cars and locomotives are making their appearance and a few additional contracts for equipment have been closed. The Chicago, Burlington & Quincy is in the market for 4000 freight cars and 40 passenger service cars. The Atchison, Topeka & Santa Fe has ordered 30 Mikado, 10 Mountain, and 10 Santa Fe type locomotives from the Baldwin company and contemplates the purchase of 25 additional engines. This road has also bought 500 gondola cars in addition to the 2500 refrigerator cars ordered a week ago. The Northern Pacific is inquiring for 1000 ballast cars and the Roger Ballast Car Co. has ordered 200 ballast cars from the American Car & Foundry Co. One of the leading car builders has taken confidential orders for 1000 refrigerator cars and 500 freight cars. The Fruit Growers Express is in the market for 500 refrigerator cars, while the Chicago, Rock Island & Pacific is asking for prices on 10 chair cars, 22 baggage cars and 30 coaches. The Chicago Great Western is inquiring for six coaches, six baggage cars, two dining cars and two mail cars. The Chicago, St. Paul, Minneapolis & Omaha is in the market for motive power.

The Grand Trunk reported last week as in the market for 3000 automobile cars and 1000 flat cars is now asking for an additional 1000 flat cars. The Union Pacific has ordered 45 caboose cars from the Pacific Car & Foundry Co. The Rock Island is in the market for 75 30-ton caboose cars and the Texas & Pacific is inquiring for 200 ballast cars of 50 tons capacity.

Plates.—Local producers have nothing to offer for general sale, but will do what they can to supply steel for car construction and repairs. The leading interest will furnish 8000 tons of plates and shapes for 1500 freight cars recently ordered by unnamed roads from a Western carbuilder. The foremost independent has not yet decided what prices will be asked for material going into railroad equipment, but will no doubt quote considerably above the corporation level. The cancellation of export business has enabled an Eastern mill to offer a limited tonnage of plates for second quarter delivery at 4c., Pittsburgh. A larger Eastern interest, as has been previously noted in this column, is also taking business at that price for second and third quarter shipment. The leading local independent expects to open its books for second half some time in April.

Structural Material.—The books of both local mills are closed except for such additional tonnage as will be accepted from manufacturers engaged in car construction or repairs. Fabricators continue to take new work despite their heavy commitments. The largest award of the week involves 2250 tons which will be fabricated by the American Bridge Co. for the new

Waukegan, Ill., plant of the H. W. Johns-Manville Co. Other recent lettings include:

A. Pingree, Idaho, sugar company, beet sugar factory buildings, Preston, Idaho, 393 tons, to Kansas City Structural Steel Co.

Addition to Sherman Hotel, Chicago, 382 tons, to American Bridge Co.

Monighan Machine Co., plant, Chicago, 284 tons, to American Bridge Co.

Pendoreille County, Wash., cantilever riveted span, Metaline Falls, Wash., 225 tons, to Milwaukee Bridge Co.

St. Louis Malleable Casting Co., foundry addition, St. Louis, 161 tons, to Federal Bridge Co.

Industrial Investment Co., theater building, Minneapolis, 159 tons, to Minneapolis Steel & Machinery Co.

Joliet Railway Supply Co., two shop buildings at Chicago, 150 tons, to Worden-Allen Co.

American Steel Foundries, brake beam shop additional, Hammond, Ind., 110 tons, to Kenwood Bridge Co.

Algeria Temple, Helena, Mont., 100 tons, to Minneapolis Steel & Machinery Co.

Current inquiries include:

Steel Sales Corporation, warehouse, Chicago, 1000 tons.

Main Street bridge, Kenosha, Wis., 725 tons.

Milwaukee Reliance Boiler Works, shop addition, Milwaukee, 140 tons, bids asked by Armand D. Koch, Wells Building, Milwaukee.

Sargent & Lundy, architects, Chicago, 100 tons, for high tension towers at Tulsa, Okla.

The mill quotation is 2.45c. to 4.00c. Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.97c. for materials out of warehouse.

Bars.—Consumers in need of mild steel bars must look to outside mills for their requirements, as both the leading interest and the foremost local independents are out of the market. One Eastern mill is taking second quarter business at 4c., Pittsburgh, while other Eastern interests are taking occasional orders at higher prices. The demand for rail-carbon and iron bars is undiminished and bookings in these products are heavy. Some large inquiries have been current of late, one calling for 5000 and another for 10,000 tons of hard steel reinforcing bars. One rail-carbon mill which is sold out for several months is invoicing March shipments at 3.75c., while another important producer, also heavily booked, is making deliveries at 3½c. Bar iron mills are taking business at prices ranging from 3½c. to 3¾c. Heavy railroad purchases of bar iron are looked for.

Mill prices are: Mild steel bars, 2.35c. to 4.25c., Pittsburgh, taking a freight of 27c. per 100 lb.; common bar iron, 3.50c. to 3.75c., Chicago; rail carbon, 3.50c. to 3.75c., mill. Jobbers quote 3.87c. for steel bars out of warehouse.

Sheets.—Sheets continue to be the scarcest of finished products. Car builders and affiliated manufacturers complain that the automobile industry has demoralized the market by offering exorbitant premiums. A Michigan automobile builder is said to have paid 9½c. for a 300-ton lot of blue annealed sheets. Local jobbers have again raised their prices. While this advance was not participated in by the warehouse of the leading interest, it has no sheets in stock.

Mill quotations are: 4.35c. to 5.35c. for No. 28 black; 3.55c. to 4.50c. for No. 10 blue annealed, and 5.75c. to 6.75c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21.

Jobbers quote, Chicago delivery out of stock: No. 10 blue annealed, 5.77c.; No. 28 black, 6.50c.; No. 28 galvanized, 8.50c.

Wire Products.—The leading interest has taken the first step toward the abandonment of the prices of March 21, 1919. Although it has not actually changed its quotations, it is now booking orders on the basis of prices ruling at time of shipment. Mill operation continues to improve slowly. For prices, see finished iron and steel f.o.b. Pittsburgh, page 787.

Rails and Track Supplies.—The Northern Pacific has purchased 10,000 tons of spikes for last half delivery, while the Omaha has ordered 1500 tons of iron tie plates at a reported price of $70 a ton. The demand for light rails is unabated and the leading interest is taking on such additional orders as it can to accommodate old customers.

Standard railroad spikes, 3.35c. to 3.60c. Pittsburgh. Track bolts with square nuts, 4.90c. to 5c., Pittsburgh. Steel tie plates and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.75c., f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. is low bidder on 3000 tons for Akron, Ohio. Milwaukee has let 750 tons to the National Cast Iron Pipe Co. The cities of Detroit and Saginaw, Mich., take bids to-day on 2900 and 1500 tons respectively.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $75.80; 6-in. and above, $72.80; class A and gas pipe, $2 extra.

Bolts and Nuts.—Inquiry is undiminished, but production is still hampered by unsatisfactory deliveries of bolt and nut stock from the mills. For mill prices, see finished iron and steel f.o.b. Pittsburgh, page 787 (jobbers' prices).

Jobbers quote: Structural rivets, 5.37c.; boiler rivets, 5.47c.; machine bolts up to ⅞ x 4 in., 35 and 5 per cent off; larger sizes, 25 and 5 off; carriage bolts up to ⅞ x 6 in., 30 off; larger sizes, 20 off; hot pressed nuts, square tapped and hexagon tapped, $1 off; coach or lag screws, gimlet points, square heads, 40 and 5 per cent off. Quantity extras are unchanged.

Old Material.—The market is unsteady, showing signs of both weakness and strength in different items. Opinion is divided as to the future course of prices, and these divergent views seem to be reflected in the quotations for the week. One source of encouragement is the reported intention of a local consumer to enter the market for a large tonnage of open-hearth melting steel. The purchase of equipment by the railroads is also expected to stimulate prices. On the other hand, some observers state the the existing supply of scrap is larger than had been generally supposed and that the demand can increase materially without affecting prices in any great degree. The Wabash offers 2000 tons, the Pere Marquette 500 tons, the Soo Line 300 tons and the Erie a blind list.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.	
Iron rails	$32.00 to $33.00
Relaying rails	40.00 to 50.00
Car wheels	35.00 to 35.50
Steel rails, rerolling	32.00 to 33.00
Steel rails, less than 3 ft.	28.00 to 28.50
Heavy melting steel	23.50 to 24.00
Frogs, switches and guards, cut apart	23.50 to 24.00
Shoveling steel	23.00 to 23.50
Low phos. heavy melting steel	27.50 to 28.00
Drop forge flashings	19.00 to 20.00
Per Net Ton.	
Iron angles and splice bars	$30.00 to $31.00
Steel angle bars	24.00 to 24.50
Iron arch bars and transoms	30.50 to 31.50
Iron car axles	39.00 to 40.00
Steel car axles	31.00 to 32.00
No. 1 busheling	20.25 to 20.75
No. 2 busheling	14.00 to 14.50
Cut forge	23.50 to 24.00
Pipes and flues	18.00 to 18.50
No. 1 railroad wrought	26.00 to 26.50
No. 2 railroad wrought	23.50 to 24.00
Steel knuckles and couplers	25.00 to 25.50
Coil springs	26.50 to 27.00
No. 1 cast	37.50 to 38.00
Boiler punchings	24.00 to 24.50
Locomotive tires, smooth	25.00 to 25.50
Machine shop turnings	13.00 to 13.50
Cast borings	13.25 to 14.25
Stove plate	30.50 to 31.00
Grate bars	30.50 to 31.00
Brake shoes	26.00 to 26.50
Railroad malleable	27.25 to 28.25
Agricultural malleable	26.50 to 27.50
Country mixed	17.00 to 18.00

Philadelphia

PHILADELPHIA, March 9.

Diminishing inquiries and better production are the principal factors in the steel situation, these applying equally to pig iron. Buyers have dropped out of the market to a considerable extent. Apparently there is little, if any, pessimism among consumers, only a spirit of caution. As to deliveries of steel, an easier tone is in evidence, particularly in plates. One mill can make shipments in about 30 days, and has recently taken business on that basis. Another mill got better production last week than was expected and had 2000 tons of plates to sell for early delivery. In the aggregate the free tonnage thus offered is not important, but it may be that as production shows further improvement more steel in some other lines will be available for early delivery. Possible exceptions are sheets and wire products. Bars are available in limited tonnages for second quarter. Several of the leading independent steel companies which were hardest hit by the steel strike and then by the coal shortage have no announcement to make as yet to their customers as to when they will open their books for forward deliveries. Some of these will have little to offer before third quarter.

An English buyer was here last week seeking mills that would accept orders for about 10,000 tons of mis-

cellaneous steel products for fairly early shipment. He was not successful. An Italian buyer also tried to place orders for ship steel. One mill was willing to take the shapes, but none could be found to take the plates, 4500 tons, on which shipments beginning this month were desired. Delivery was more important to this buyer than price. He was willing to pay 4.50c., Pittsburgh, for plates.

Railroad buying has not taken on much momentum. The Pennsylvania Railroad has bought 2000 tons of plates in addition to the orders for about 7500 tons placed the week before, and the Western Maryland will buy another 1000 tons. Car builders will need large tonnages of plates, but a number of them which are customers of the leading interest reserved tonnages about the first of the year with that corporation. Therefore, the independents are not expecting to be called upon to furnish much of the steel for new cars.

Pig Iron.—An advance in the price of foundry pig iron to $45 for second half, which was put into effect by one Eastern interest two weeks ago, has not been followed by other producers. Prices generally quoted for that delivery are on the basis of $43, furnace. For prompt delivery standard foundry iron has been sold at $44 to $45, furnace, but some off-grade iron offered by steel companies at concessions has given consumers an impression of weakness in the market. Probably the quantity of such off-grade iron on the market is exaggerated because of the fact that it is being offered by a number of brokers. There is no great pressure for foundry iron for prompt delivery or for the second, third and fourth quarters. Basic iron is also quiet, but inquiries would probably be met with quotations of $42, furnace. Some sales of copper bearing low phosphorus iron for first half have been made at $47, furnace. An Eastern producer of malleable iron names a price of $45.75, furnace, with $1 freight to Philadelphia. Virginia foundry iron trade is quiet. A New England consumer has bought 200 tons, 3.75 to 4.25 per cent silicon, $48.25, furnace. It is now possible to ship pig iron to England with cotton at $7 a ton, and exporters predict that if the exchange rate should become normal some time in the near future, considerable foundry iron will be shipped to that country, inasmuch as the delivered price of No. 3 foundry iron would be $48.80, based on the present market, which is considerably lower than the competing grade of British iron. Although THE IRON AGE statistics as to pig iron production in February showed a gain in the entire country, the foundry iron furnaces of the East, almost without exception, showed a loss. Iron sellers here predict a serious shortage of foundry grades before the end of the year.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

Eastern Pa., No. 2 X, 2.25 to 2.75 sil.	$45.35 to $46.35
East. Pa., No. 2 plain, 1.75 to 2.25 sil.	44.10 to 45.10
Virginia No. 2 plain, 1.75 to 2.25 sil.	46.10
Virginia No. 2 X, 2.25 to 2.75 sil.	47.35
Basic deliv. Eastern Pa.	43.40
Gray forge	43.00
Standard low phos. (f.o.b. furnace)	50.00
Malleable	46.75
Copper bearing low phos. (f.o.b. furnace)	47.00

Ferroalloys.—A local broker has sold 1000 tons of domestic ferromanganese for second half at $160, delivered. Otherwise the market is dull. Spiegeleisen is quoted at $57.50, furnace.

Semi-Finished Steel.—Though there is scarcely enough business in semi-finished steel being done in this market to establish prices definitely, open-hearth rerolling billets are generally quoted at $60 to $65, Pittsburgh, and forging billets at $70 to $75, Pittsburgh, to which must be added a freight rate of $4.10 to Philadelphia.

Plates.—Some steel companies note a falling off in inquiries for plates, while others assert that there is a ready market for all that can be promised for early shipment. An Italian buyer here last week wanted 4500 tons of ship plates, with deliveries to begin this month, and was unable to find a mill willing to take the business, though a price of 4.50c., Pittsburgh, was no hindrance so far as the buyer was concerned. One mill which was willing to take the shapes tried to find a plate mill willing to guarantee delivery of the plates. The Pennsylvania Railroad has bought an additional 2000 tons of plates, the price paid, it is reported, being 4c., Pittsburgh. The Western Maryland, which bought 1000 tons of plates, will probably duplicate this order. Plates for locomotive work and car building are in demand, though many of the car builders have reserved tonnage with the leading interest, which will probably take care of their requirements. The independent mills do not expect to figure on much of this business. The Baldwin Locomotive Works is almost constantly in the market, its president, Samuel M. Vauclain, having stated a few days ago that the orders booked by his concern for locomotives since Jan. 1 exceed the total number of orders received in 1919. Better production of plates is now indicated. An Eastern mill, which has been down to 50 per cent production or less in recent weeks, is now working at 65 to 70 per cent of normal, with conditions steadily improving.

Structural Material.—The Virginia Bridge & Iron Co. will fabricate 4000 tons for the Hibernia Bank Building, New Orleans. Shapes and plates will be furnished by a Pittsburgh mill. One Eastern interest, which has virtually been out of the market for some weeks because of decreased production, is about to open its books again, as its mills are beginning to resume operations. Its price, which has been 3.50c., Pittsburgh, may be advanced. Most of the Eastern mills are quoting 4c., Pittsburgh, on such tonnage as they are willing to take, which is a very limited amount.

Bars.—Contracts for bars for second quarter are still being made by one interest, which has now reserved a large tonnage for its customers, the price being 4c., Pittsburgh. Some other mills are quoting 3c., but are taking only small lots with delivery not guaranteed before third quarter. Fairly early deliveries of bar iron are obtainable, the prices being on the basis of 4c., Pittsburgh.

Spikes.—An Eastern maker has advanced spikes, ½ in. and larger, from 4c. to 4.25c., Pittsburgh.

Old Material.—The scrap market is quiet and the tendency at the moment is toward softness in some grades, but dealers predict that increased consumption at steel plants will result soon in a better demand and that prices will go higher. An Eastern maker of forgings has bought about 12,000 tons of low phosphorus scrap, paying $34 or more. An interesting feature of the market is the continued demand for scrap for export to China. A local dealer has been shipping 2000 to 3000 tons a month to that country at prices higher than are obtainable here. We quote prices for delivery at consuming points in this territory as follows:

No. 1 heavy melting steel	$25.50 to $26.50
Steel rails rerolling	34.00 to 35.00
No. 1 low phos., heavy, 0.04 and under	34.00 to 35.00
Car wheels	42.50 to 45.00
No. 1 railroad wrought	30.00 to 32.00
No. 1 yard wrought	36.50 to 37.50
No. 1 forge fire	22.00 to 23.00
Bundled skeleton	21.00 to 22.00
No. 1 busheling	24.00 to 25.00
No. 2 busheling	18.50 to 19.50
Turnings (short shoveling grade for blast furnace use)	19.00 to 20.00
Mixed borings and turnings (for blast furnace use)	19.00 to 20.00
Machine-shop turnings (for rolling mill and steel works use)	21.00 to 21.50
Heavy axle turnings (or equivalent)	23.00 to 24.00
Cast borings (for rolling mills)	23.00 to 24.00
Cast borings (for chemical plant)	28.00 to 30.00
No. 1 cast	40.00 to 41.00
Railroad grate bars	30.00 to 31.00
Stove plate	30.00 to 32.00
Railroad malleable	30.00 to 31.00
Wrought iron and soft steel pipes and tubes (new specifications)	25.00 to 26.00
Iron car axles	45.00 to 46.00
Steel car axles (f.a.s. New York for export)	39.00 to 40.00

The Steel Club of Philadelphia, composed of sales managers representing steel companies in that city, held its annual election Tuesday. William H. Hoffman, Brier Hill Steel Co., was re-elected president, and Frank W. Jones, Eastern Steel Co., was re-elected secretary-treasurer. Thomas W. Simpers, American Sheet & Tin Plate Co., was elected vice-president; G. T. Shants, Lukens Steel Co., and C. O. Hadly, Alan Wood Iron & Steel Co., members of board of directors.

Boston

BOSTON, March 9.

Pig Iron.—Sales of pig iron on this market during the past week were less than 4000 tons, by far the smallest tonnage reported in many months. The lack of business is due to a combination of things, but chiefly to the railroad transportation situation, and the tendency of those melters who are covered for the first half to await price developments. One house reports sales of eastern Pennsylvania iron on a $46 furnace base, but iron is still available at $44 and $45, and small lots of resale at $43. Sales of Buffalo iron were confined to a few 100 and 200-ton lots on a $45 furnace base, and practically no Virginia iron sold, that market being nominally on a $42 base. A small tonnage of high silicon Alabama sold on a $58 to $59 delivered base. Delivered pig iron prices follow:

Eastern Pennsylvania silicon, 2.25 to 2.75	$46.90 to $50.15
Eastern Pennsylvania silicon, 1.75 to 2.25	45.65 to 48.90
Buffalo silicon, 2.25 to 2.75	48.15 to 50.15
Buffalo silicon, 1.75 to 2.25	46.90 to 48.90
Virginia silicon, 2.25 to 2.75	47.95
Virginia silicon, 1.75 to 2.25	46.70
*Alabama silicon, 2.25 to 2.75	47.35 to 50.35
*Alabama silicon, 1.75 to 2.25	45.75 to 48.75

*Alongside Boston prices.

Warehouse Business.—Local warehouses have made a general advance of 25c. to 50c. per 100 lb. in iron and steel quotations. Since November last, iron and steel has gone out of warehouses much faster than it has come in, and a majority of concerns have virtually no steel on hand to-day and comparatively little iron. Those houses having little steel on hand are quoting soft steel bars in the same manner as they are refined iron. That is, they charge more for ½ in. and 9/16 in. round and square and 2⅝ in. round and square and larger, and 7/16 in. round and square and smaller, and over 6 in. wide, than the quoted base price. The Boston & Maine Railroad has been endeavoring to buy large amounts of bolts and nuts from warehouses, without much success. Semi-finished nuts, ½ in. and smaller, are noticeably scarce. Lock washers have been advanced and manufacturers have issued new lists which eliminate buying advantages previously held by large consumers over jobbers.

Jobbers quote: Steel bars, cold rolled rounds, $6.25 per lb. base; squares, hexagons, flats, $6.75 base; soft steel rounds, $4.75 base; flats, 6 in. wide and narrower, over 2 in. thick, $5.25 base; flats, over 6 in. wide and thicker than 1 in., $5.60; flats, wider than 6 in. and not even inches, $5.60; concrete bars, plain round and square, stock lengths, $4.75 base; twisted squares, $5.25; angles, channels and tees under 3 in., stock lengths, $4.75 base; angles, channels and beams 3 in. and over, $4.75; tees, 3 in. and over, standard, $5; Z's, $5.25; tire steel, 1½ in. x ½-in. and larger, $5.45 base; narrower and thinner, $5.95; spring steel, open hearth, $9 base; special, $13; toe calk steel, $6.50 base; steel hoops, $7.25; steel bands, $6.25 base; bands over 6 in. wide x ¼-in. thick, $6.50 net; bands over 6 in. wide x 3/16-in. thick, $6.40 net; iron, refined, except as follows, $4.75 base; ½-in., 9/16-in. round and square and 2⅝ in. round and square and larger, $5.15 base; 7/16 in. round and square and smaller, $6.75; over 6 in. wide, $6.25; best refined iron, $6 base; Wayne, $7 base; band iron, $6.25 base; hoop iron, $7.25 base; Norway iron, $20 base; all less than full bundles, except hoops, ½c. per lb. extra; broken bundles of hoops, 2c. per lb. extra; No. 10 blue annealed sheets, $6.30 base; No. 28 black sheets, $8.15 base; No. 28 galvanized sheets, $9.50 base; plates, ¼ in. and heavier, $5.30 base.

Finished Iron and Steel.—Bethlehem Grey sections have advanced $5 a ton to $3.50, f.o.b. Pittsburgh, but the company still quotes $3.25 on standard sections. Stone & Webster have awarded 180 tons structural to the Lakeside Bridge & Steel Co., Milwaukee, for the Westinghouse Lamp, Milwaukee, plant. The Boston & Maine Railroad asks bids on structural for 15 bridges aggregating approximately 300 tons, and the Boston & Albany on two bridges involving a larger tonnage. The American Bridge Co. is awarded about 200 tons for New Haven Railroad bridge repair work. Mills will accept few orders for flange plates and give car repair plants a preference. New England car repair works need more plates. A Bath, Me., shipbuilding plant is in the market for a sizable tonnage. Bethlehem's New England allotment of universal plates virtually is sold on a $3.50 f.o.b. Pittsburgh base, but other mills are in the market for business. A Massachusetts stove interest this week bought 300 tons black sheets for June delivery. Orders for third quarter delivery bars are being taken in a limited way at prices to be made later. Two lots of shell steel, one having 0.30 to 0.40 and the other 0.40 to 0.60 carbon, aggregating 5000 tons, are offered here at $50, f.o.b. Pittsburgh, but the best offer obtainable is $40, from a rerolling plant. The New Haven Railroad has not covered its rail requirements, needing about 40,000 tons more.

Old Material.—One local house sold 500 tons No. 1 machinery cast at 2c. per lb. delivered, and there have been scattered purchases of car lots as high as $47 to $48 a ton delivered by foundry interests caught short of material owing to railroad transportation conditions, but aside from such business the scrap market has been very quiet. Pennsylvania furnace demands for heavy melting steel are satisfied and the market easily is $1 a ton lower in the absence of buying. There is some call for car wheels, but dealers will not pay more than $35, f.o.b., for them, which represents a drop of about $1.50 in the market. Otherwise prices for old material remain unchanged. Prices as quoted by the local yards follow:

No. 1 heavy melting steel	$21.00 to $22.00
No. 1 railroad wrought	32.00 to 33.00
No. 1 yard wrought	25.00 to 26.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	20.50 to 21.50
Machine-shop turnings	16.50 to 17.00
Cast iron borings	19.50 to 20.50
Heavy axle turnings	18.00 to 19.00
Blast furnace borings and turnings	15.00 to 16.00
Forged scrap	16.50 to 17.50
Bundled skeleton	16.50 to 17.50
Street car axles	31.00 to 32.00
Car wheels	35.00 to 36.00
Machinery cast	39.00 to 40.00
No. 2 cast	37.00 to 38.00
Stove plate	27.50 to 28.50
Railroad malleable	28.00 to 29.00
Rerolling rails	29.00 to 30.00

Coke.—The coke market has been active since last reports, New England foundry as well as outside consumers figuring in the purchases. The Providence Gas Co. has sold its entire output for the last half, and the New England Coal & Coke Co. 70 to 75 per cent of its last half capacity. There is every indication the latter company will be out of the contract market before the close of another week.

Buffalo

BUFFALO, March 8.

Pig Iron.—The market remains about the same as reported last week with moderate inquiry and moderate sales. There has been no very urgent inquiry for a considerable time, and since foundries have covered extensively, it is not believed much more inquiry for this year will result. Less than 5000 tons of foundry pig iron, it is believed, were sold during the past week by three makers. One sold between 1000 and 2000 tons, while two others sold about 1000 tons each. All this iron was sold at a $45 base price for the lower silicon up to $46.25 and $48 for the higher grades. A 7000-ton lot of basic was closed at a price of $43. Most of the basic sold of late has been at $44. The car shortage continues to hamper shipments. One furnace has piled the major portion of its last three weeks' output, and other furnaces report conditions stringent. Another furnace is getting better shipment and is sending out as high as 1700 to 1800 tons per day. Foundries are hard-pressed and are pleading for small shipments. The coke supply has been poor owing to sickness of men at the ovens, and one furnace here was forced to bank one week due to insufficient coke.

We quote f.o.b. Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$48.00
No. 2 X foundry, 2.25 to 2.75 silicon	46.25
No. 2 plain, 1.75 to 2.25 silicon	45.00
Basic	$43.00 to 44.00
Malleable	46.25
Lake Superior charcoal	58.00 to 60.00

Finished Iron and Steel.—The demand keeps up for all grades of material. There is an exceptionally heavy demand for tin plate and wire products, but this scarcely overshadows the intense demand for plates, bars, shapes and cold-finished steel. Mills find it next to impossible to take new business, but where at all possible are trying to come to the assistance of old customers where they are hard-pressed for material. Prices are a little stronger, but the spread is about the same. The difference is that some mills that were obtaining a medium price are this week getting a better figure. Warehouse prices are also at variance, some customers

being asked more for material than others. There is a complete absence of solicitation of orders by mills. Shipments are becoming better, it is said. An improvement is also noticed in the morale of the railroad forces, since the roads were returned to private ownership, short as the time has been. Mills are still unable to ship as much as they can manufacture and yards are badly congested.

Old Material.—Though the car situation has improved somewhat, dealers say it will take two months at the present rate of loading to get present business on books shipped out of yards. The shortage of cars has been pronounced for weeks, but within the last week more rolling stock is available and this has given shipping an impetus. Certain developments seem to indicate that there will be a revival of activity within the near future. Steel castings plants that obtain most of their business from the railroads are already beginning to show an interest in low phosphorus scrap, the grade principally used by them. A sale of low phosphorus scrap was made during the past week at $32.50. Several inquiries for good-sized tonnages of this scrap are now before the market. Heavy melting steel is quiet, with local mills not particularly interested. One sale of 1000 tons is said to have been made during the week at $26.50.

We quote dealers' asking prices, per gross ton f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades	$26.50 to $28.00
Low phos., 0.04 and under	32.00 to 33.00
No. 1 railroad wrought	33.00 to 34.00
No. 1 machinery cast	38.00 to 39.00
Iron axles	40.00
Steel axles	40.00
Car wheels	37.00 to 38.00
Railroad malleable	31.00 to 32.00
Machine-shop turnings	17.00 to 17.50
Heavy axle turnings	21.00 to 22.00
Clean cast borings	20.00 to 21.00
Iron rail	30.00 to 31.00
Locomotive grate bars	24.00 to 25.00
Stove plate	32.00 to 33.00
Wrought pipe	21.00 to 22.00
No. 1 busheling	22.00 to 23.00
Bundled sheet stamping	19.00 to 20.00

New York

NEW YORK, March 9.

Pig Iron.—The most interesting features of the market at present are the insistent demand for deliveries and increasing inquiry from foreign countries. Many foundries have been crippled by not obtaining iron promptly and are urging furnaces to ship as rapidly as possible. Inquiry from the Far East and also from Great Britain and the Continent is coming from well-known exporters and some hope is entertained that the export movement will increase, but not much more can be done in shipping to Europe unless the exchange situation changes radically. The ocean freight rate to England is about $10 and to Belgium $8. Domestic buying is very light. Prices appear to be easier, but this is due largely to the fact that most quotations are now made for last half delivery, while heretofore much of the quoting has been done for the first half at a somewhat higher level than for the last half. Coke conditions are highly unsatisfactory owing to the inadequate supply of cars.

We quote for delivery in New York as follows:

No. 1 foundry, sil. 2.75 to 3.25	$47.05 to $48.05
No. 2 X, sil. 2.25 to 2.75	46.05 to 47.05
No. 2 plain, sil. 1.75 to 2.25	44.80 to 45.80
No. 2 X, Virginia, sil. 2.25 to 2.75	46.40

Ferroalloys.—The ferromanganese market continues very strong but quiet. There are frequent inquiries for deliveries of small quantities up to July but the amount available is scarce. For such positions it is difficult to buy anything for less than $200 to $225, delivered, for the American product or seaboard for the British alloy. A limited quantity of British alloy has been sold and is still obtainable at around $200, seaboard, for early delivery. Domestic producers are quoting $175, delivered, for third quarter and $160 for the last half, but it is believed that the former quotation could be shaded on desirable business. One inquiry from an American producer for 200 to 300 tons has brought out a British quotation exceeding $200, seaboard, for delivery in the first half. Imports in January were 2771 tons which compares with an average of 2752 tons per month in 1919. Around 21,000 tons of spiegeleisen is before the market for export consumption. Domestic demand is quiet with quotations from $57 to $60, furnace. An interesting fact is the sale of a large quantity of foreign ore for nearby and extended future delivery, the details not being available. Imports in January were 21,463 tons, which compared with 27,779 tons per month in all of 1919. Ferrosilicon, 50 per cent, is in good demand with the quotation at $85 per ton, delivered. Considerable business has been transacted recently.

Finished Iron and Steel.—Aside from tentative inquiries for car material from railroads and car builders, the local steel market is much quieter. Some sales offices note a pronounced falling off in inquiry. As yet much of the railroad buying is contingent on financial arrangements. The New York Central will open bids Wednesday (March 10) on 11,500 freight cars. The original inquiry called for 13,200, but 1700 flat cars have been canceled. The Virginian Railroad is in the market for 1000 120-ton gondolas. The Baltimore & Ohio is asking for bids for repairing 2000 cars, 1000 of which are wood. The Erie Railroad has 1900 wood cars to be repaired. There is additional inquiry for passenger cars, the Chicago, Burlington & Quincy being in the market for quite a number. Some orders for bridge work are also being let by the railroads, the American Bridge Co. having taken 1000 tons for the Delaware, Lackawanna & Western and the same road has let 1800 to another fabricator for a coal breaker at Scranton, Pa. Other structural work let includes 5300 tons for the Liggett-Winchester-Ley Building, Madison Avenue and Forty-third Street, New York, awarded to the McClintic-Marshall Co.; 4000 tons for the Munson Building, Wall Street, New York, to the American Bridge Co.; 1200 tons for the Sporting Club, Lexington Avenue, New York, to the American Bridge Co., and 1300 for the Lycoming Foundry & Machine Co., Williamsport, Pa., to the American Bridge Co. The City Club, Boston, is in the market for 1400 tons. Demand for locomotives continues. The order of the Canadian National Railroad placed with the American Locomotive Co. now calls for 67 instead of 55 as reported last week. It is estimated that there are now 1500 locomotives before the market, including 280 for New York Central, 100 for the St. Paul, and 80 to 100 for the Illinois Central. Makers of axles are concerned over costs with billets $60 to $70 and the forgings selling at 3.65c. per lb., the price which has obtained since the early weeks of 1919. There is accordingly some likelihood of early divergent prices in this form of finished steel, with top prices of 3.90c. to 4c. Sales to Canada are not likely to be large in view of the 35 per cent duty and a 7½ per cent war tax on top of this, and exchange requiring an additional outgo in Canadian currency in excess of 16 per cent, all making $1 worth of material in the United States cost when imported into Canada over $1.65. Demand from automobile manufacturers for forgings for delivery in 1920 with the price to be fixed later has not been satisfied.

We quote for mill shipment, New York, as follows: Soft steel bars, 2.62c. to 4.77c.; shapes, 2.72c. to 4.27c.; plates, 2.92c. to 4.27c., the minimum prices being for indefinite delivery and the higher prices for the second quarter; bar iron, flats, wider than 6 in., 4.07c.; ⅝ and 7/16 in., round and square, 4.47c.; light rounds, squares and flats, 4.77c., and other sizes, 3.77c.

Cast-Iron Pipe.—Though this is the season which usually brings out orders for municipalities, such orders are this year lacking, due doubtless to the high prices and to the conservative policies of city governments. Prices are being well maintained with shading no more than 50 cents a ton, and this for unusually desirable business. A few orders of small tonnages have been taken for export, particularly for South America. Several orders are turned away because prompt delivery is demanded. We quote 6-in. and heavier at $70.30, New York; 4-in., $73.30, with $2 additional for Class A and gas pipe.

Old Material.—Dealers report cast scrap a trifle softer, some predicting that the peak in price has been reached. We have marked down No. 1 machinery by $1. Other grades are practically unchanged with the exception of No. 1 yard wrought, which has been demanded by a New Jersey consumer, and for which a New York

dealer has paid $31. Machine-shop turnings have realized a slight decline. To the embargoes was added the bad weather last week, both of which are hindering shipments. Dealers and brokers are generally optimistic, pointing to the rising tendency of pig iron and finished steel prices.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$21.00 to $22.00
Rerolling rails	30.00 to 31.00
Relaying rails, nominal	48.00 to 50.00
Steel car axles	34.00 to 35.00
Iron car axles	43.50 to 44.00
No. 1 railroad wrought	33.00 to 34.00
Wrought iron track	24.50 to 25.00
Forge fire	18.00 to 18.50
No. 1 yard wrought, long	27.00 to 27.50
Light iron	10.00 to 11.00
Cast borings (clean)	19.50 to 20.00
Machine-shop turnings	16.00 to 16.50
Mixed borings and turnings	16.00 to 16.50
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	21.50 to 22.00
Stove plate	29.50 to 30.00
Locomotive grate bars	29.50 to 30.00
Malleable cast (railroad)	29.00 to 30.00
Old car wheels	39.00 to 40.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$41.00 to $42.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	40.00 to 41.00
No. 1 heavy cast, not cupola size	31.00 to 32.00
No. 2 cast (radiators, cast boilers, etc.)	33.00 to 34.00

Cincinnati

CINCINNATI, March 9.

Pig Iron.—Pig iron continues dull, very little inquiry being before the market. The largest sales reported in this territory during the week were two 1000-ton lots and two 500-ton lots, all Southern iron. These lots all went at $40, Birmingham. A large furnace interest in southern Ohio came into the market during the week and disposed of about 25,000 tons for delivery during the second half. This tonnage was distributed among its regular customers at $42 furnace. It is reported that this interest has now advanced to $43. A Southern furnace also offered iron during the week at $40 for the base grade, but so far as known did not dispose of any considerable quantity. This iron was for last half delivery. While quotations of Southern range all the way from $40 to $44, most of the business is being placed at $40, though sales of small lots are being made at $42. Virginia iron continues to be sold at $42 furnace. Rumors are current that a silvery furnace is having some trouble and may have to go out for repairs. Should this be the case, it would make more serious the shortage now prevailing in this grade, as the scarcity of coke is holding up the blowing of two silvery furnaces which have been under repair. Malleable is quiet, no sales being reported. Quotations range from $42 to $48; and order for 5000 tons of basic, inquiry for which was before the market last week, is understood to have been placed with a Valley furnace. A large machine tool concern which inquired for 3000 tons of foundry iron is understood to have decided not to purchase at this time. While the market is quiet, the undertone is firm, buyers and sellers both being of the opinion that prices have reached a level which may prevail for the rest of the year. Shortage of cars is beginning to be felt by Southern furnaces, some of which are now piling iron.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	$43.60 to $45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	44.85 to 46.85
Ohio silvery, 8 per cent sil	56.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	43.80 to 45.80
Basic Northern	41.80
Malleable	43.80 to 45.80

Finished Material.—Local warehouses report a slight improvement in deliveries during the past week. Whether this can be attributed to the fact that the car situation has improved, or that greater efforts are being put forth to keep goods in transit moving, they are unable to state. Prices are holding firm in all lines, and jobbers are still maintaining their attitude of taking care of their old customers first. Demand for sheets is still tremendous, and large premiums are being offered for prompt delivery. Mills in southern Ohio now report that they are running up to capacity, but are not booking any new business, as they are so loaded up with orders that it will be many months before they can see their way clear to open their books. Meantime regular customers are being taken care of to some extent at least. Brokers are offering sheets at from 10c. to 15c. a pound, but the prevailing quotation from the regular sources of supply is from 5.70c. for black to 7c. for galvanized. Reinforcing bars and cast-iron pipe are in great demand, particularly the latter, and one contractor, who is figuring on a contract for a pipe line in California, is having great difficulty in getting his order placed. In structural steel, the Monitor Stove & Range Co., through the Austin Co., Cleveland, will soon call for bids for the construction of a new plant which will require a large tonnage, and the Standard Silicate Co., which is also constructing a large plant here, will be in the market for structural steel. Machine tool manufacturers are experiencing some difficulty in securing deliveries on their contracts, but, as they have a stock on hand sufficient to last them over the next two months, no fear is entertained that they will have to curtail operations on this account. Wire products have shown some improvement in deliveries, but the scarcity of nails in particular is so great that it will be many months before stocks will be anywhere near normal. Warehouse prices remain unchanged.

Coke.—No improvement is noticed in the coke situation. The demand for spot coke is exceedingly heavy, but car shortage continues to be the greatest handicap to securing supplies. It is generally agreed that should the Government price be removed, coke would jump anywhere from $5 to $8 a ton.

Old Materials.—The scrap market is firmer. There is a scarcity of both steel and cast scrap, and prices have an advancing tendency. While quotations generally remain at last week's level, cast borings are 50c. higher and machinery cast $1 higher. Dealers predict higher prices in the near future.

Per Gross Ton

Bundled sheet	$16.00 to $17.00
Old iron rails	27.00 to 28.00
Relaying rails, 50 lb. and up	46.00 to 47.00
Rerolling steel rails	30.00 to 31.00
Heavy melting steel	22.00 to 23.00
Steel rails for melting	24.00 to 25.00
Car wheels	29.00 to 30.00
No. 1 railroad wrought	26.00 to 27.00

Per Net Ton

Cast borings	$14.00 to $14.50
Steel turnings	12.00 to 12.50
Railroad cast	31.00 to 32.00
No. 1 machinery	35.00 to 36.00
Burnt scrap	22.00 to 23.00
Iron axles	29.50 to 30.00
Locomotive tires (smooth inside)	23.50 to 24.50
Pipes and flues	17.00 to 17.50
Malleable cast	23.00 to 23.50
Railroad tank and sheet	16.00 to 16.50

Birmingham

BIRMINGHAM, ALA., March 9.

The try-out of the consumers at $42 and $43 and even that at $41, which was inaugurated about March 1, had failed up to the first of the week to produce any rush for Birmingham iron at those prices. The market still presented the kaleidoscopic feature of the preceding week with the Steel Corporation making a few sales at $38, one large foundry interest booking several small lots at $42 with one 600-ton lot at $43 for western delivery; another large foundry interest avowing strict adherence to the $42 level, but admitting little business done; and still another stating that, after advancing to $41, it made one sale at that price and no more business resulted. Simultaneous with this situation, a foundry interest offered the open market 10,000 tons for second half delivery at $40 and in a few days had sold 4000 tons, the bookings being scattered in St. Louis, Ohio, Indiana, Minnesota and Wisconsin territory. This business brought the current market back to the $40 base so far as real business was concerned. Indications coming at the beginning of the week were that $42 base was not as it appeared to be the week before and none seemed sorry that the market had been stabilized to that extent. February iron output equaled that of February a year ago. It would have run larger but for an acute car shortage preventing prompt assemblage of raw materials.

The Tennessee company has blown out No. 3 Ensley stack for relining. That interest now has five active stacks at Ensley and one at Alice on basic and one at Bessemer on foundry. The Sloss-Sheffield company blew in the Philadelphia furnace at Florence, Ala., on March 5 and now has five active foundry stacks. The Alabama Co. expects to resume at No. 2 Gadsden stack by April 1. That stack is being relined. Car shortage caused one interest to pile 5000 tons in February, others in proportion.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

Foundry, silicon 1.75 to 2.25	$40.00 to $42.00
Basic	39.00 to 41.00
Charcoal	55.00

Cast Iron Pipe.—Monroe, La., has placed order for 750 tons of water pipe. Numerous Southern municipalities have let small tonnages. United States Cast Iron Pipe & Foundry Co. is installing machinery for manufacture of flange pipe in the Anniston plant. Russell C. Hunt and associates have plans for building a sanitary pipe plant at Gate City, near Birmingham. Stringer Brothers, Chicago, will build a sanitary pipe and fittings plant in Gadsden. Expansion in this industry is on an unexampled scale.

Coal and Coke.—Home coke users are well cared for and some are stocking up, but Pacific Coast business has been declined on account of the car shortage. One of these declined orders was for 1200 tons for the Southern Pacific. Southwestern movements are also badly handicapped. Prices remain firm at Government maximums of $9.50 and $10.50.

Old Material.—The scrap market is seriously affected by the car situation and heavy steel remains weak, but all cast grades are firm at market prices.

We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails	$21.00 to $21.50
No. 1 heavy steel	20.00 to 20.50
Cast iron borings	11.00 to 11.50
Machine-shop turnings	11.00 to 11.50
Stove plate	24.00 to 24.50
No. 1 cast	31.00 to 32.00
Car wheels	30.00 to 31.00
Tramcar wheels	28.00 to 29.00
Steel axles	29.00 to 30.00
No. 1 wrought	21.00 to 21.50

St. Louis

ST. LOUIS, March 9.

Pig Iron.—The market for pig iron was rather quiet and the only transactions reported were on small lots for prompt shipment. The foundries making gray iron castings are pretty well supplied, at least for immediate and near future needs, while the big consumers of basic are also in good shape, the Scullin plant having bought 35,000 tons within the past few months and the American Steel Foundries 25,000 tons, while the Commonwealth Steel Co., largely operating on railroad work, has been pretty well supplied under stocks acquired while operating on war-time orders. There is also an impression in the trade that pig iron prices have been boosted high enough and nothing above $40 is being offered by intending purchasers, although No. 2 Southern is quoted by furnace representatives at $42, Birmingham, No. 2 Northern at $45 Ironton, and the local furnace, which is in a sold up condition, and which will not blow in before April 1, is holding its iron at $47.

Coke.—The lack of cars and the Government control of prices continue to operate against coke transactions, the ovens being indifferent to business which they would have to take at $7 Connellsville, $8 New River, or $8.25 Virginia. Contracts are being taken care of satisfactorily, but the new business is nil. By-product plants in this territory are sold up and there is, therefore, no business appearing in that direction.

Finished Iron and Steel.—Although the chief interest in finished products was permitted the past week to take on additional specifications on structural material and plates for second quarter delivery, there was no other change in the situation noted. Immediate delivery is altogether out of the question, and no business is wanted for third and fourth quarters. Prices remain at the same figures which have been standing for some time. Movement out of warehouse continues up to the capacity of stocks to supply needs, but there is a demand for much greater quantities than are available or in prospect. Advances were noted during the week in sheets, but otherwise no changes in prices were reported.

For stock out of warehouse we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.59c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 5.84c.; No. 28 black sheets, cold rolled, one pass, 7.10c.; No. 28 galvanized sheets black sheet gauge, 8.60c.

Old Material.—In the scrap market there is a continuance of better feeling, due chiefly to sentiment, however, rather than to actual transactions. The big foundry interests are reported to have or to expect good-sized orders from the railroads, especially those on the east side of the river, and this is leading dealers to stiffen their determination to hold their material for better prices. Lists out during the week include 2100 tons from the Wabash, 2000 tons from the St. Louis & San Francisco, and 1600 tons from the Missouri, Kansas & Texas, while the Missouri Pacific System put some on the market at private sale without issuing any formal list.

We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$32.50 to $33.00
Old steel rails, rerolling	32.50 to 33.00
Old steel rails, less than 3 ft.	28.00 to 28.50
Relaying rails, standard sections, subject to inspection	45.00 to 50.00
Old car wheels	33.50 to 34.00
No. 1 railroad heavy melting steel	24.50 to 25.00
Heavy shoveling steel	22.50 to 23.00
Ordinary shoveling steel	21.50 to 22.00
Frogs, switches and guards, cut apart	26.00 to 26.50
Ordinary bundled sheets	16.00 to 16.50
Per Net Ton	
Heavy axle and tire turnings	19.00 to 19.50
Iron angle bars	28.00 to 28.50
Steel angle bars	23.00 to 23.50
Iron car axles	37.00 to 37.50
Steel car axles	33.00 to 33.50
Wrought arch bars and transoms	31.00 to 31.50
No. 1 railroad wrought	25.50 to 26.00
No. 2 railroad wrought	23.50 to 24.00
Railroad springs	23.00 to 23.50
Steel couplers and knuckles	24.00 to 24.50
Locomotive tires, 42 in. and over, smooth inside	25.00 to 25.50
No. 1 dealers' forge	23.00 to 23.50
Cast iron borings	15.00 to 15.50
No. 1 busheling	22.00 to 22.50
No. 1 boiler, cut to sheets and rings	18.50 to 19.00
No. 1 railroad cast	35.50 to 36.00
Stove plate and light cast	30.50 to 31.00
Railroad malleable	26.50 to 27.00
Agricultural malleable	26.00 to 26.50
Pipes and flues	20.50 to 21.00
Heavy railroad sheet and tank	20.00 to 20.50
Railroad grate bars	29.50 to 30.00
Machine-shop turnings	15.50 to 16.00
Country mixed	22.50 to 23.00
Uncut railroad mixed	23.50 to 24.00
Horseshoes	24.00 to 24.50

Cleveland

CLEVELAND, March 9.

Iron Ore.—It is estimated that furnaces have purchased 65 to 75 per cent of their total requirements of ore for the season. Buying has tapered off sharply and sales during the week were limited to a few small lots. Little activity is expected for some time. Interest in the ore market is centered in the contract vessel rates which are expected to be fixed this week. Owing to the car shortage, frozen ore and scarcity of labor, dock shipments are rather slow and some furnaces are finding it difficult to get ore as fast as needed. This situation is expected to be relieved as soon as weather conditions improve.

Dock shipments during February were 645,785 tons as compared with 910,848 tons during February, 1919. On March 1 there were 9,015,813 tons of ore on docks as compared with 7,725,086 tons on the corresponding date a year ago.

We quote, delivered, lower Lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesaba Bessemer, $7.20; Mesaba non-Bessemer, $6.55.

Pig Iron.—Sales and inquiries continue rather light. While prices on foundry iron are firm at $42 to $43, at Lake and Valley furnaces for No. 2 foundry for last half, there appears to be a feeling that the price peak has been reached and the easing up in demand for early shipment foundry iron has caused one or more sellers who have been asking $43 to $43.50 for No. 2 foundry iron for delivery before July to lower their quotations

to from $42 to $43, both for prompt shipment and second quarter. One interest reports the sale during the week of 9000 tons of foundry and malleable iron for the last half. A Michigan stove company took 2000 tons at a $42 base price, an Ohio foundry 1000 tons and an Indiana melter 1500 tons of malleable iron. A Valley furnace sold 1000 tons of foundry iron at $42 for shipment to western Pennsylvania for June-December delivery. A Cleveland producer is now adhering to $43 for foundry iron. Steel-making iron is inactive, and it is claimed that no more basic iron is to be had under $43 for the first half. It has developed that a northern Ohio consumer who recently came into the market for early shipment basic iron bought 2000 tons at $41.50; 2000 tons at $42.50 and 3000 tons at $43. A southern Ohio furnace is understood to have opened its books for last half contracts at $42 for No. 2 foundry. Tennessee iron is being quoted at $42 for 1.75 and 2.25 silicon iron for the last half, but Alabama furnaces are asking $43. Stocks in foundry yards are generally low and foundries are crowding furnaces for shipments. Some foundries have only two or three days supply of iron in their yards. Furnaces are able to get only about enough cars to move their product from day to day, but are unable to secure cars to make shipments from stock piles.

We quote delivered Cleveland as follows:

Basic	$41.40 to $43.40
Northern No. 2 foundry, sil. 1.75 to 2.25	42.40 to 43.40
Southern foundry, sil. 2.25 to 2.75	48.25 to 48.70
Gray forge	41.40
Ohio silvery, sil. 8 per cent	58.40
Standard low phos., Valley furnace	48.00 to 49.00

Ferroalloys.—Ferromanganese is being quoted at $200 delivered for 76 to 80 per cent for shipment until July 1. However, the same producer is making quotations of $160 for delivery during the nine months starting April 1 and another seller is quoting a $175 price for the same delivery. One seller is quoting spiegeleizen at $60 for the second quarter and last half.

Coke.—Virginia producers last week opened their books for foundry coke contracts for the last half or full year at $9 at oven. This compares with the present Government price of $8.25. However, the contracts provide that should the Government continue to regulate prices, the Government prices shall prevail and there is also a clause in the contracts which makes the price subject to an advance or decline should there be changes made in the miners' scale of wages. Considerable business was placed during the week on this basis. The coke shortage is as acute as ever, and many foundries are compelled to shut down occasionally for a day on account of lack of fuel. There is a heavy demand for Indianapolis by-product coke for foundry purposes, but the maker is entirely sold up for the present.

Finished Iron and Steel.—Automobile manufacturers are crowding the mills for steel and would place orders for extended future delivery were they able to do so. Rim manufacturers are attempting, but apparently without success, to place orders for round tonnages for delivery to the end of the year. Being unable to purchase sheets to cover their early requirements, automobile makers continue to buy sheet bars for conversion and sales of several thousand tons of open-hearth sheet bars are reported at $90 to some of these manufacturers. Forcing premium prices up to their present levels is attributed almost wholly to the automobile makers, to some of whom the cost of steel is apparently a secondary consideration. One Pittsburgh mill is selling steel bars, plates and structural material at 4c. for second quarter delivery, but finds that some consumers outside of the automobile field are not inclined to contract at this price. Bessemer wire rods and basic high carbon rods have brought new high prices in sales at $80 for the former and $102 for the latter for early delivery. A Pittsburgh district mill is now selling nails at 4.25c. and plain wire at 3.75c. for 30 to 60 days delivery. One mill is asking 8.50c. for blue annealed sheets, but other quotations range from 6c. to 6.50c. On black sheets there is a spread in quotations from 7.50c. to 9c. There is a lull in the demand for structural steel, the present high prices of building material and high wages in the building trades having resulted in the postponement of a number of building projects. The Riverside Bridge Co., Martins Ferry, has taken 4000 tons for a 20-story office building for the Cleveland Discount Co. and the Massillon Rolling Mill Co. has received bids for a plant extension requiring 1200 tons.

Old Material.—The scrap market continues dull, but the sentiment has improved and dealers expect that prices will take an upward trend when mills again come into the market. At the present it is almost entirely a dealers' market. Dealers have plenty of orders, and as a rule are not trying to make sales, devoting their attention almost entirely to shipping scrap on old orders. Shipments are rather slow on account of the embargoes and the difficulties in securing cars. While heavy melting steel is still quoted at $26 and under, this is at present a dealers' price. For shipment to mills, dealers are asking $27.50 and consumers could probably not buy a round tonnage at a lower price. A Cleveland mill has purchased some heavy melting steel directly from a railroad at $26.50, and a sale of several hundred tons of plate shearings has been made to a Cleveland mill at $26. We also note the sale of 1000 tons of short turnings at $18, these being shipped from Detroit to a Cleveland mill. Another sale of 700 tons of low phosphorus melting scrap at $26.75, producers' yard, at Lorain, Ohio, was made for shipment to Buffalo. A few hundred tons of compressed steel brought $23.50. Drop forged flashings are a drug on the market and lower.

We quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$25.75 to $26.00
Steel rails, under 3 ft.	29.00 to 30.00
Steel rails, rerolling	33.00 to 33.50
Iron rails	32.00 to 33.00
Iron car axles	41.00 to 42.00
Steel car axles	36.00 to 37.00
Low phos. metling scrap	30.00 to 31.00
Cast borings	18.25 to 18.50
Iron and steel turnings and drillings	15.25 to 15.75
Short turnings for blast furnaces	18.00 to 18.50
Compressed steel	22.50 to 23.00
Railroad wrought	29.00 to 30.00
Railroad malleable	32.00 to 32.50
Agricultural malleable	27.00 to 28.00
Steel axle turnings	22.50 to 23.00
Light bundled sheet scrap	18.00 to 18.50
No. 1 cast	39.00 to 40.00
No. 1 busheling	22.00 to 22.50
Drop forge flashings, over 10 in.	17.85 to 18.25
Railroad grate bars	30.00 to 31.00
Stove plate	30.00 to 31.00

San Francisco

SAN FRANCISCO, Feb. 24.

While the report cannot be verified, there is a general impression that the strikers in the local shipyards are preparing to call off their strike soon.

Bars, Shapes, Plates, Sheets.—The demand for bars continues in excess of the present supply. Prices have been advanced by the mills to $4.25, and by the jobbers to $5.25. Deliveries are about 60 days. The California Insurance Co., San Francisco, has just received bids for about 2000 tons of structural steel for a new building. It is said that exceptionally few bids were made, but no statement is made regarding figures. In Seattle the Postal Telegraph Co. has called for bids for 2000 tons of structural steel, and in San Francisco a number of apartment houses are calling for several hundred tons each. The supply of sheets is being exhausted and new shipments are said to be arriving slowly. Galvanized sheets in less than carload lots have been advanced by the jobbers to a $9.50 base. Black sheets sell on a $8.05 base for No. 28. Plates are in rather better supply here than most material. Outside the shipyards, which buy little in this market, the demand is not large at this time.

Pipe.—There is plenty of demand for wrought pipe, but arrivals are inadequate and the jobbers report that their stocks show constant depletion. There is practically no 2-in. and smaller pipe at any of the jobbers' at the present time. Inquiry for cast iron pipe continues very extensive. The fact that many municipalities are holding or are about to hold special elections for improvements to water systems indicates a

brisk cast iron pipe business for a considerable time. The City of Calexico is calling for bids for 500 tons of pipe. Prices were advanced last week $3 to a $66 base.

Pig Iron.—The price of pig iron in this market has been advanced, and it is now quoted at $69 per gross ton, delivered at the foundries. The foundries are having all their needs supplied and the supply appears ample for all demands.

Old Material.—Scrap of all kinds is scarce, and prices are higher. Malleable is selling in excess of $29 per net ton. Cast iron scrap is bringing $45 per net ton, and while no price is being made on wrought or steel scrap, other than the $26 agreed upon several weeks ago, there is none available at that price, and it is apparently an open market with all advantages resting with the seller. A price of $30 for this grade of scrap would not be surprising at any time.

FRENCH IRON AND STEEL WORKS

Further Lorraine Plants Taken Over—Increased Pig Iron Output

(*Special Correspondence*)

PARIS, FRANCE, Feb. 15.—Hematite pig iron is becoming rare in France and its manufacture is almost nil by reason of lack of transportation and inability to secure ore. In Lorraine the shipments of fuel are more frequent and three blast furnaces at Knutange and two at Hagondange have been restarted.

The reconstruction plans of the Denain-Anzin plant provide for the concentration of the total production of pig iron at Escaudain. The four blast furnaces of this division actually destroyed are soon to be reconstructed.

Stockholders of the Société Minière et Metallurgie des Fondeurs de France has authorized an increase in capital from 10,000,000 to 15,000,000 francs, according to the needs of the company.

The Societé Normande de Metallurgie has at its plant at Mondeville two blast furnaces of 350 to 400 tons capacity each per day. One of these is in operation and the second is expected to be working soon.

The Comptoir of Longwy, France, has decided to maintain its present prices throughout February.

It is announced that several more blast furnaces will be restarted in Lorraine.

The Société Lorraine Minière et Metallurgie is the declared bidder for the Karlshütte plant situated at Thionville, Lorraine. The amount bid was 33,000,000 francs. The Société Lorraine is still negotiating for the Roechling plant at Voelklingen near Sarrebrüch in the Sarre. This acquisition will require about 70,000,000 francs. It also has in view the acquisition of coal concessions in Lorraine disannexed. The capital required for this is considerable and if it goes through the deal will be participated in by four or five groups.

British Prices Still Higher

Germany Offering Iron Bars—Steel Strike Settlement Near—Scotch Molders Threaten Strike

(*By Cable*)

LONDON, ENGLAND, March 9.

The pig iron situation is still acute and makers are unwilling to sell, pending an advance in prices. Demand is unabated. The iron ore position is very tight. For Bilbao and Rubio ore 72s. c.i.f. has been paid. Ferromanganese has been advanced officially to £32 10s. for domestic consumption and £35 for export.

The steel position is unaltered. Scotch makers advanced prices £2 per ton and northeastern makers £1. Traffic congestion is worse. Germany is offering small lots of iron bars c.i.f. United Kingdom and soliciting bids. Japan is inquiring for angles.

Large orders of plates are constantly being placed, the only difficulty is to get makers to accept them. Plants are already full this year and many are sold well into next and could probably double their order books if they cared to sell indefinitely ahead.

The tin plate market is panicky, owing to probable steel strike settlement. For prompt delivery they have sold up to 78s. f.o.b., and for stock plates 80s. is asked. Tin plate workers are now demanding a further advance in wages. Galvanized sheets are strong at £56 paid for 24 gage corrugated for May. Scottish iron molders threaten strike for more money.

We quote per gross ton, except when otherwise stated, f.o.b. makers' works, with American equivalent figured at $3.62 for £1, as follows:

	£	s.		£	s.		
Ship plates	24	10	to	28	10	$88.69	to $103.17
Boiler plates	28	10	to	32	0	103.17	to 115.84
Tees	22	10	to	29	0	81.45	to 104.98
Channels	21	15	to	28	5	78.73	to 102.26
Beams	21	10	to	27	0	77.82	to 97.74
Round bars, ¾ to 3 in.	24	0	to	29	10	86.88	to 106.79
Rails, 60 lb. and up	20	15	to	22	5	75.12	to 80.55
Billets	23	0				83.26	
Sheet and tin plate bars, Welsh	23	0	to	30	0	83.26	to 108.60
Galv. sheet, 24 g.	51	0	to	56	0	184.62	to 202.72
Cleveland basic iron	9	5				33.48	
West Coast hematite	12	5				44.35	
Cleveland No. 3 foundry (export)	11	10				41.63	

Fuel and Labor Shortage Hampering Pig Iron and Steel Markets—New Shipbuilding Companies

LONDON, ENGLAND, Feb. 16.—The predominant features continue to be, first, the enormous demand for all products; second, the fact that works are taxed to their utmost and booked as far ahead as they care to go, and last, their inability to increase output owing to fuel scarcity, car shortage or lack of men. In some instances where the men are obtainable, the works find themselves unable to increase their forces through lack of housing accommodation.

General stringency of supplies continues to be the outstanding factor in pig iron. It is reported that in the Midlands production is being hampered by shortage of fuel and that it is feared some furnaces will have to be blown out. In Scotland the No. 1 grade is very scarce and some makers are out of the market. Meanwhile demand is strong and prices are firm with an upward tendency. As regards Cleveland iron there is little change, foundry descriptions continuing in very short supply and even home consumers unable to get more than a portion of their needs. An excellent export business could be done but orders have to be turned down in very many cases. Owing to lack of fuel, idle furnaces cannot be started. For hematite iron the demand is also strong. Prices for the home trade are nominally unchanged, with 5s. more for France, Belgium and Italy, but anything that is available for other countries realizes premiums.

The steel situation is similar to that of pig iron in so far as difficulty of securing material is concerned. Works are booked far ahead and the minimum home trade prices have recently been advanced 20s. These prices are, however, really only nominal, while for export all manner of quotations are mentioned. It is reported that the demand for billets and sheet bars is increasing. New orders are refused by American works which are booked up for months, and from the Continent little or no relief can be expected. Meanwhile in finished steel the home demand for some descriptions is enough to almost absorb the output.

It is reported that a new company has been formed to carry on shipbuilding on the Medway. It is believed that the intention is to build merchant ships and possibly passenger ships also of 6000 to 10,000 tons deadweight, and it is understood that the company has orders in hand for two years.

It is announced by Sir Edward Mackay Edgar of Sterling & Co. of New York that they have completed the purchase of the National Shipbuilding yards at Chepstow, in the interests of Lord Glanely, John Cory, T. E. Morel, T. H. Mordey, W. Leon, W. R. Smith, Sir W. Seagar, Fairfield Shipbuilding & Engineering Co. and Anglo-Saxon Petroleum Co. It appears to be the intention to enter into an extensive shipbuilding program. The purchasers have large interests in connection with ship owning and shipbuilding. It is stated that the Chepstow yards were originally built as assemblage yards and not therefore equipped for actual

shipbuilding. The work was carried out on what is known as the fabricating plan, that is, the materials were manufactured at the usual centers to be put together at the yards. Some enterprise and capital is therefore required before the yards can be properly equipped for ordinary shipbuilding. It seems that the contract includes the sale of nine ships in various stages of construction in the yards.

Another item of interest in connection with shipbuilding is the announcement that the control of Workman, Clark & Co., the second largest shipbuilders in Belfast, has been acquired by the Northumberland Shipbuilding Co., which has lately been rapidly extending its activities. With this new acquisition the combination will, it is stated, be the strongest single organzation in the British shipbuilding industry.

Delayed Deliveries and Prices May Deter Railroad Buying

The tight money situation, high prices, and the prospect of delayed deliveries may force the railroads to defer purchases of much of the rolling stock they require. The inquiry of the American Refrigerator Transit Co. for 2028 refrigerator cars is said to have been dropped for these reasons and the Illinois Central and the Chicago, Milwaukee & St. Paul have purchased 1650 gondola cars and 3000 box cars respectively from the Government, these being among the last of the unallocated cars built by the Railroad Administration. A year ago, when the first Government cars were being delivered, some of the railroad corporations did not want to accept them because they were built at prices far in excess of those prevailing before the war. At present, however, these prices look good in comparison with those asked.

Among new inquiries for rolling stock in the West is one for 40 passenger service cars issued by the Chicago, Burlington & Quincy Railroad. This road also expects to enter the market for freight cars, but in this respect is no different from most other roads in this territory. Practically all of them are working on specifications, but whether purchases will actually be made will depend on the considerations previously mentioned. Even though buying of new equipment is delayed, it is believed that car repair work alone will assume very large proportions. The Pennsylvania Railroad has let contracts to Western carbuilders for the repair of 2100 freight cars, and is said to have ten times that number which will have to be rehabilitated.

It is possible that the carbuilding companies may be able to assist the railroads in financing some of the new equipment that the carriers wish to buy. Three contracts, recently closed, involving a total of 2000 cars, were closed under such an arrangement.

Plans of the Allsteel Supply Co.

At a meeting March 4 stockholders of the Allsteel Supply Co., Niles, Ohio, elected these directors: R. L. McCorkle. John O. Pew, J. E. Fitzgerald, A. E. Quere and M. N. Fitzgerald. Directors elected J. E. Fitzgerald president and treasurer, A. E. Quere vice-president and general manager and M. N. Fitzgerald secretary. J. E. Fitzgerald resigned, effective March 1, as assistant general sales manager of the Brier Hill Steel Co., Youngstown, Ohio. Mr. Pew was formerly president of the Youngstown Iron & Steel Co. Mr. Quere was in the sales department of the Brier Hill company.

The Allsteel Supply Co. has opened temporary offices in the post office building at Niles and is now doing business. The contract has been let for a steel building, 50 x 100 ft., to be erected by the Truscon Steel Co. and to be ready for occupancy by the middle of May. It will be located on a 20-acre site owned by the company near Niles and tapped by the Erie, Baltimore & Ohio and Pennsylvania railroads.

At the start the company will confine its business to the jobbing of iron and steel products, and has already received an encouraging volume of business. Equipment will be installed in its warehouse for cutting material or altering it to meet needs of the purchaser. Later additional buildings will be erected for the manufacture of stamped metal products. With such installations the company will employ several hundred men.

Its capital is $250,000, divided into $50,000 of preferred and the balance common. About $200,000 has been subscribed and there is no additional stock on the market.

Canadian Railroad Orders

TORONTO, ONT., March 9.—According to an announcement made by D. B. Hanna, president of the Canadian National Railways, equipment orders involving an expenditure of approximately $25,000,000 have been placed by that system. This constitutes one of the largest sets of contracts issued in the Dominion at any one time for rolling stock, and coming almost simultaneously with the Canadian Pacific Railway orders, will guarantee much activity for the Canadian car builders. An announcement was made by the Canadian Car & Foundry Co., Montreal, last week that orders aggregating $7,000,000 had been placed with that company by the Canadian National Railways, and $5,000,000 by the Canadian Pacific Railway. The Canadian National Railways' orders are as follows:

The Canadian Locomotive Co., Kingston, Ont., 45 locomotives.

The Montreal Locomotive Works, Montreal, Que., 67 locomotives.

The Canadian Car & Foundry Co., Montreal, Que., 18 sleeping cars, 12 dining cars, 20 baggage cars, 1600 box cars, 600 refrigerator cars and 80 cabooses.

The Eastern Car Co., Trenton, N. S., 500 box cars, 1150 coal cars and 6 snow plows.

The National Steel Car Co., Hamilton, Ont., 1500 box cars.

The Preston Car & Coach Co., Preston, Ont., 20 cabooses.

The Hart-Otis Car Co., Montreal, Que., 350 ballast cars.

In addition to the contracts Canada's railways are placing for equipment, they are also developing an extensive building program, which includes the erection of car shops, stations, round houses, freight car shops, yard improvements as well as extensions to their existing lines.

Louisville, Ohio, Sheet Company Formed

The Louisville Sheet Steel Co., which will build a sheet mill plant for fabricated products at Louisville, Ohio, has effected its organization. James Fraunfelter, Canton, is president; O. H. K. McCoy, who has charge of the galvanizing department of the Berger Mfg. Co., is vice-president; H. L. McKenzie, who has been general sales manager of the Canton Corrugated Co., is treasurer and general manager, and J. W. Lucas, for several years sales manager of the J. N. & L. E. Osborn Co., Cleveland, is secretary.

Prices of Aluminum Products

The Aluminum Co. of America, Pittsburgh, has recently advanced prices on aluminum ingots and also on aluminum sheets. Its prices are now as follows: Aluminum ingots, 33c. per lb. in 50-ton lots; 33.10c. in 15-ton lots, and 33.20c. in one-ton lots. Prices on aluminum sheets are as follows: No. 18 gage and heavier, 44c. per lb. in 50-ton lots; 44.20c. in 15-ton lots and 44.40c. in one-ton lots. For gages 19 and 20 prices in 50-ton lots are 45.10c.

Ashtabula Sheet Mill Project

The sheet mill project recently launched in Ashtabula, Ohio, has been financed and a company to be known as the Ashtabula Steel Co. will be incorporated with a capital stock of $1,500,000. The company plans to erect an eight-mill plant. Robert Lock, formerly with the Apollo Steel Co., will be president and general manager.

Detroit Furnace Sold

The Detroit Furnace Co., an interest of M. A. Hanna & Co., has sold its property and the stack will be dismantled to provide a site for an industrial plant. The furnace was built in 1870 and had an annual capacity of 30,000 tons. It went out of blast six months ago.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper New York		Tin.	Lead		Zinc	
March	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
3	18.75	18.75	62.75	9.35	9.10	9.05	8.70
4	18.75	18.75	62.00	9.35	9.10	9.00	8.65
5	18.62½	18.62½	63.00	9.35	9.10	8.95	8.60
6	18.50	18.50	....	9.50	9.15	8.85	8.50
8	18.50	18.50	61.50	9.50	9.15	8.85	8.50
9	18.50	18.37½	60.25	9.50	9.15	8.95	8.60

NEW YORK, March 9.

All the markets except lead and antimony are quiet and weaker. Copper demand is negligible and prices have further declined. Buying of tin by consumers is insignificant and quotations for spot metal have followed the wildly erratic London speculative market. Supplies of lead continue unequal to consumption and prices have further advanced. Demand for zinc is very light and quotations have fallen. Antimony is slightly stronger.

New York

Copper.—Because of the continued absence of consuming demand, either for domestic or foreign consumption, prices have further declined until to-day electrolytic copper is obtainable for deliveries up to June at around 18.37½c., New York, with Lake for the same deliveries obtainable at around 18.50c. Most of the large producers are quoting 18.50c., New York, for electrolytic for nearby delivery, but this could be shaded on a desirable order. For 500 tons of electrolytic copper for export 18.50c. was quoted to-day. On such business a slight premium is the rule over domestic business. The slump is regarded generally as only temporary and a better demand for both export and domestic consumption is looked for in the very near future.

Tin.—The tin market continues dull and extremely quiet with buying of very small proportions by consumers. The only activity that has been discernible has been among dealers and it is apparent that consumers are not uneasy, probably being well supplied with the metal. Last week Thursday a fair business of about 300 to 400 tons was done between dealers for future delivery at around 63c. to 63.25c., the spot market on that day having been 62c., New York. On Friday quotations for future delivery were from 63.25c. to 64c. Quotations for spot metal have been highly erratic, as shown by the values quoted above, and this has been entirely due to the wide fluctuations in the London speculative market. To-day that market was quoted from £14 to £15 lower than yesterday. Spot Straits to-day in London was quoted at £372 in contrast with £411 a week ago, and in New York at 60.25c. The drastic decline in London is attributed to the British labor situation in steel and its effect on the tinplate output. Because of the erratic movements in exchange it is still impossible for dealers to do any figuring, consequently any substantial business. Arrivals of tin thus far this month have been 500 tons and the quantity afloat is reported as 5465 tons.

Lead.—The market continues very strong. The same situation prevails that has persisted for some time, namely, short supplies and good consumption and this has resulted in a further advance in prices. Last Friday the American Smelting & Refining Co. again advanced its price ¼c. to 9c., St. Louis, or 9.25c., New York, the outside market having already reached 9.35c, New York. To-day independent sellers and producers are asking 9.50c., New York, or 9.15c., St. Louis, with demand very strong and supplies very scarce, especially for spot delivery. A fact that is regarded as significant is that consumers are not anxious to buy futures and this is taken to indicate that the high level of this movement has practically been reached. The principal concern of most producers now is to produce the lead and ship it on contract. Demand for export is reported as strong, with a fair business transacted.

Zinc.—There has been a further recession in demand both for domestic and foreign consumption and prices have further declined, the low level having been reached yesterday at 8.50c., St. Louis, or 8.85c., New York, for prime Western for early delivery, with some sales reported as low as 8.37½c., St. Louis. Values have been largely nominal and have fluctuated with the declines in the London speculative market, the effect of conditions over there having been especially prominent in Monday's dealings. To-day the market is a little firmer at around 8.60c., St. Louis, or 8.95c., New York, for deliveries up to July and in some cases into the third quarter, the London market being £2 higher per ton.

Antimony.—Wholesale lots, five tons and over, for early delivery are quoted at 12c., New York, duty paid, and the market is strong.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable from 31c. to 33c., New York, for early delivery in wholesale lots, depending on whether it is offered by outside sellers or from the leading interest.

Old Metals.—The market was somewhat discouraged this week on account of the lower quotations of ingot copper, but scrap prices were practically unchanged, as holders would not sell at lower figures and very little business was put through. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	19.00
Copper, heavy and wire	18.00
Copper, light and bottoms	16.50
Brass, heavy	14.00
Brass, light	10.00
Heavy machine composition	18¼
No. 1 yellow rod brass turnings	11.75
No. 1 red brass or composition turnings	16.00
Lead, heavy	8.00
Lead, tea	6¼
Zinc	6.00

Chicago

March 9.—Quotations have deviated but little from the prices of a week ago. Copper is marking time and is slightly weaker. Tin is stiff and importers are predicting an advance; very good demand and an improved exchange have been sources of strength. Lead has been moving rather freely and prices are held firmly, but in the opinion of some traders have reached the top. Spelter has been bought in round lots, but offerings have been in excess of orders, and prices have sagged. There has been a good business in antimony, with prices on future shipments a little easier. We quote Lake copper 19.25c. for carloads, tin 63c. to 64c., lead 9.10c. to 9.25c., spelter 8.75c., and antimony 12.50c. On old metals we quote copper wires, crucible shapes, 15.50c.; copper clips, 15.25c.; copper bottoms, 14c.; red brass, 15.50c.; yellow brass, 11.25c.; lead pipe, 7c.; zinc, 6.25c.; pewter, No. 1, 37.50c.; tinfoil, 40c., and block tin, 50c., all these being buying prices for less than carload lots.

St. Louis

March 8.—The non-ferrous metal markets have been strong, with a good demand for all the metals. On car lots we quote: Lead, 9c.; spelter, 8.75c. On less than car lots the quotations are: Lead, 9.50c.; spelter, 9.75c.; tin, 68c.; copper, 21.50c.; antimony, 14c. In the Joplin district ores were stronger, with lead well held at $105 per ton, basis 80 per cent; zinc blende at $52.50, basis 60 per cent, and top grades selling at $1 premium for each 1 per cent of higher analysis, and calamine, with little in the market commanding as high as $40 per ton, basis 40 per cent. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 9c.; heavy yellow brass, 10.50c.; heavy red brass, 15c.; light copper, 13c.; heavy copper and copper wire, 16c.; pewter, 35c.; tinfoil, 43c.; zinc, 5c.; lead, 6c.; tea lead, 3c.; aluminum, 24c.

The Wetherell Brothers Co., formerly 31 Oliver Street, Boston, is now located at 251 Albany Street, Cambridge, where it has erected a modern warehouse.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Prices quoted below represent as closely as they can be given those charged by mills to their regular trade for indefinite shipment. Owing to practical famine in supply of finished steel products and the heavy demand existing, tenders of new business are being made to the mills by jobbers and consumers at higher prices than those quoted below, but as a rule the mills are turning this offered business away)

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Jan. 1, 1920, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49.5½c.; Denver, 99c.; Omaha, 59c.; minimum carload 80,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; St. Paul and Minneapolis, 49.5c.; minimum carload 46,000 lb.; Denver, 99c.; minimum carload, 46,000 lb. Jacksonville, Fla., all rail, car lots, 41.5c.; less, 59c.; rail and water, car lots, 34.5c.; less, 46.5c. A 3 per cent transportation tax applies. On iron and steel items not noted above rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural size, 2.45c. to 3c.

Wire Products

Wire nails, $3.25 to $4.00 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50, and shorter than 1 in., $2.00. Bright basic wire, $3 to $3.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3 to $3.50; galvanized wire, $3.70 to $3.95; galvanized barbed wire and fence staples, $4.10 to $4.45; painted barbed wire, $3.40 to $3.75; polished fence staples, $3.40 to $4.50; cement-coated nails, per count keg, $2.85 to $3.75; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.50 base
Large boiler rivets.....$4.60 base
Small rivets.....50 per cent off list
Small machine bolts, rolled threads.....40, 10 and 5 per cent off list
Same sizes in cut threads.....40 and 5 per cent off list
Longer and larger sizes of machine bolts.....30 and 10 per cent off list
Carriage bolts, ⅝ in. x 6 in.:
Smaller and shorter, rolled threads.40 and 5 per cent off list
Cut threads.....30 and 10 per cent off list
Longer and larger sizes.....30 per cent off list
Lag bolts.....50 per cent off list
Plow bolts, Nos. 1, 2 and 3 head.....40 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅝ in. x 4 in.:
Smaller and shorter.....35 per cent off list
Longer and larger sizes.....25 per cent off list
Hot pressed and cold pressed sq. or hex. blank nuts.....2c. off list
Tapped nuts.....$1.75 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:
⅝-in. and larger.....60 and 5 per cent off list
9/16-in. and smaller.....70 and 5 per cent off list
9/16-in. and smaller A. L. A. M. or S. A. E.....70, 10 and 5 per cent off list
Stove bolts in packages.....70 and 10 per cent off list
Stove bolts in bulk.....70, 10 and 2½ per cent off list
Tire bolts.....55 and 10 per cent off list
Track bolts.....6c. base

One cent per lb. extra for less than 200 kegs. Rivets in 100 lb. kegs 25c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $65; chain rods, $70 to $75; screw rivet and bolt rods and other rods of that character, $65 to $70. Prices on high carbon rods are irregular. They range from $75 to $100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, ½ to 9/16 in. and larger, $3.60 per 100 lb. in lots of 200 kegs, of 200 lb. each or more; spikes, ⅝-in. and 7/16-in., $4.25; 5/16-in., $5; track bolts, $4.90 to $5. Boat and barge spikes, $4.25 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C. $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4.00c. from mill. Common bar iron, 4.50c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe, applying as from Jan. 14, 1920, and on iron pipe from Jan. 7, 1920:

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	1	+25
½	51	36½	⅜	25½	+1½
¾ to 3	54	41½	½	29½	11½
			¾ to 1½	34½	18½
			2 and 2½	33½	17½

Lap Weld

2	47	34½	1¼	24½	9½
2½ to 6	50	37½	1½	31½	17½
7 to 12	47	33½	2	28½	14½
13 and 14	37½		2½ to 6	30½	17½
15	35		7 to 12	27½	14½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	¼	+7	+40
½	48	35½	⅜	23½	6½
¾ to 1½	52	39½	½	28½	15½
2 to 3	53	40½	¾ to 1½	34½	19½
			2 and 2½	34½	19½

Lap Weld, extra strong, plain ends

2	45	33½	1¼	21½	6½
2½ to 4	48	36½	1½	27½	13½
4½ to 6	47	35½	2	29½	16½
7 to 8	43	29½	2½ to 4	31½	19½
9 to 12	38	24½	4½ to 6	30½	18½
			7 to 8	22½	10½
			9 to 12	17½	5½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	40½	1¾ and 1⅞ in.	+20
2½ to 3¼ in.	30½	2 and 2¼ in.	+10
2¼ in.	24	2½ and 2¾ in.	+ 1
1¾ to 2 in.	19½	3 and 3¼ in.	— 1½
		3½, 4 and 4½ in.	— 8

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Prices of the steel corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills have no trouble in getting prices quoted in the right-hand column, or even higher prices.

Blue Annealed—Bessemer

	Cents Per Lb.
Nos. 8 and heavier	3.50 to 4.50
Nos. 9 and 10 (base)	3.55 to 4.55
Nos. 11 and 12	3.60 to 4.60
Nos. 13 and 14	3.65 to 4.65
Nos. 15 and 16	3.75 to 4.75

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15 to 5.15
Nos. 22 to 24	4.20 to 5.20
Nos. 25 and 26	4.25 to 5.25
No. 27	4.30 to 5.30
No. 28 (base)	4.35 to 5.35
No. 29	4.45 to 5.45
No. 30	4.55 to 5.55

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70 to 5.70
Nos. 12 to 14	4.80 to 5.80
Nos. 15 and 16	4.95 to 5.95
Nos. 17 to 21	5.10 to 6.10
Nos. 22 to 24	5.25 to 6.25
Nos. 25 and 26	5.40 to 6.40
No. 27	5.55 to 6.55
No. 28 (base)	5.70 to 6.70
No. 29	5.95 to 6.95
No. 30	6.20 to 7.20

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15 to 5.15
Nos. 17 to 21	4.20 to 5.20
Nos. 22 to 24	4.25 to 5.25
Nos. 25 to 27	4.30 to 5.30
No. 28 (base)	4.35 to 5.35
No. 29	4.40 to 5.40
No. 30	4.40 to 5.40
Nos. 30½ and 31	4.45 to 5.45

Machinery Markets and News of the Works

CONDITIONS ARE MIXED

Good Machine-Tool Business in Spots, but Cancellations Also in Evidence

Falling Off in Inquiries and Sales in Some Markets Offset to Certain Extent by Good Buying Elsewhere

Counter currents are in evidence in the machine-tool trade. While there is good buying in spots throughout the country, with prices of some tools still advancing, there is on the other hand a marked falling off in inquiry in some markets and there have been cancellations, though it is doubtful if these in the aggregate have yet assumed any great importance.

New England, which was somewhat behind the rest of the country in getting into a more active industrial stride, is still buying fairly well, but at Chicago, Cleveland, Cincinnati and to a certain extent in the New York territory both orders and inquiries have dropped below the average maintained in the past few months. Nor is this surprising to the trade in view of the long deliveries quoted on many standard tools, together with high prices. A feeling of hesitation is in evidence, too, among some industries.

Railroad business is looming and may become an important factor soon. Very little buying has yet been done by the roads since March 1, but new inquiries are appearing. The Great Northern Railroad has inquired for about 15 machines in Chicago. The New York, New Haven & Hartford, which inquired for 21 engine lathes and 14 radial drills, is expected to buy soon. The Pennsylvania Railroad is also expected to buy new equipment for its Trenton, N. J., shops. Among car builders there is some activity, the American Car & Foundry Co. having last week started to place a large number of orders for its various shops. Quotations were received two or three months ago, but actual purchases were held up pending the return of the railroads to private control.

The Federal Shipbuilding Co., Kearny, N. J., has been one of the large buyers in the East. Among its purchases are a 16-ft. planer and an 80-in. lathe.

In Chicago one company bought 23 18 in. x 10 ft. engine lathes and may buy 10 more. Another purchaser, an oil company, took 10 lathes, 26 to 32 in. Automobile companies continue to buy at Chicago, notably Studebaker and Nash. The American Bridge Co. is in the market there for new tools.

A Russian machinery dealer visited Cleveland last week and placed orders contingent on the establishing of commercial relations between the Soviet Government and the United States. Purchases of machine tools amounting to several millions of dollars are forecasted if trade is resumed between the two countries.

The Erie Bolt & Nut Co., Erie, Pa., is in the market at Cleveland for a round lot of bolt-making and other machinery, but otherwise the Cleveland market is dull, with few sales and a noticeable drop in the number of inquiries.

At Cincinnati, however, machine-tool manufacturers indicate satisfaction with the volume of business they are getting. The Oakland Motor Car Co. and the Standard Parts Co. were two of the larger buyers of the past week.

New York

NEW YORK, March 9.

Although inquiries have fallen off and orders also to some extent, there is still surprisingly good business in machine tools, better, in fact, than some in the trade had looked for this month. One order from a New England manufacturer for one class of machines amounted to $50,000, which is an indication that there is little hesitation about placing business when there is sufficient assurance of work to keep the new equipment busy. On the part of some prospective buyers there is, however, a degree of hesitation, partly due, no doubt, to the high prices and long deliveries on practically all standard tools.

Railroad business is looming as an important factor. The New York, New Haven & Hartford Railroad, whose list of 21 engine lathes and 14 radial drills, was reported last week, is expected to close very soon. The Pennsylvania Railroad, which has gotten a good many quotations on a variety of tools in the past two or three months, is also expected to buy shortly for its Trenton, N. J., shops. Other railroads in the East may buy, but in some cases no appropriations are available yet. To fill urgent requirements it is possible that some roads will buy second-hand tools, which they seldom, if ever, did prior to the war. There will be need for lathes from tool-room sizes up to 36 in.; planers from 32 to 42 in.; radial drills, 3 to 5 ft.; slotters, 6 to 18 in.; horizontal boring mills, vertical boring mills, upright drills, turret lathes, etc., and on some of these machines deliveries are so far off that the railroads may be forced to look for used tools that can be put on their work quickly. In the special tools for railroad shops, such as axle lathes, car wheel and driving wheel lathes, journal trueing lathes, car wheel borers, etc., there is also liklihood of long deliveries as most of the makers of such tools have their shop capacity well taken up for some time ahead with other work. It is probable, however, that efforts will be made by the machine-tool industry to give the best possible deliveries in order to put the railroads back into serviceable condition.

The return of the railroads to private ownership will result in buying of machine-tool equipment by car builders and other manufacturers who supply rolling stock and accessories to the railroads. The American Car & Foundry Co. is the first of the equipment manufacturers to place orders on a large scale, its New York office having started last week to buy extensively for all of its shops.

The Federal Shipbuilding Co., Kearny, N. J., is a large buyer, its requirements covering a range of tools. One order placed last week was for a 16-ft. planer, costing about $80,000, and another was for an 80-in. lathe.

In the automotive field some buying is still going on. The International Motor Co., Plainfield, N. J., is buying. The Spalding Chain Co., Bloomfield, N. J., a subsidiary of the General Motors Corporation, has also placed orders, mostly for automatic screw machines. The Willys Corporation, Elizabeth, N. J., is believed to have about completed its buying, which during the past three months has totalled two or three million dollars or more.

The Farrel Foundry & Machine Co., Ansonia, Conn., is placing orders for its new Buffalo plant. The Chapman Valve Mfg. Co., Indian Orchard, Mass., is also buying on a fairly large scale.

An inquiry for about 25 tools, including planers, boring mills, vertical turret lathes, etc., comes from the Pennsylvania Pump & Compressor Co., Easton, Pa., a new company made up of executives from the plants of the Ingersoll-Rand Co. and the A. S. Cameron Steam Pump Works. The new company will manufacture hydraulic pumping machinery and air compressors. Easton capital has financed the company. A 55-acre site has been purchased. The first building will be 100 x 200 ft. Among the men who are active in the company are the following: Norman A. Messinger, formerly works manager Cameron plant; Ward Ray-

mond, formerly chief engineer Easton plant of Ingersoll-Rand Co.; William C. Merwarth, formerly shop superintendent Easton plant of Ingersoll-Rand Co.; William E. Anderson, formerly chief engineer Cameron plant at Phillipsburg, N. J.; Ellis R. Snovel, formerly purchasing agent Easton plant of Ingersoll-Rand Co.; Major Frank M. Godley, formerly auditor and cost accountant Easton plant at Ingersoll-Rand Co.; Ellis Nathan, steam pump engineer at Cameron plant.

The Columbia Graphophone Co., Bridgeport, Conn., has bought additional equipment for its Toronto, Ont., and Baltimore plants.

Colgate & Co., Jersey City, N. J., last week bought about $25,000 worth of tools for their machine shop.

Deliveries on tools are becoming further extended and some additional price advances have been made. On certain standard tools June or July is the best shipment that can be made, and in quite a few instances delivery will be in the last quarter of the year. There have been some cancellations, however, though in the aggregate it cannot be said that these are yet important.

Crane sales continue good, although inquiries are fewer than during the month of February. One manufacturer reports larger sales the past month than at any time during the war. A number of old inquiries have become active and will probably be closed in a few days, these being from the Morse Drydock & Repair Co., New York; the Nichols Copper Co., Laurel Hill, L. I., and the New York Municipal Railways Co., Brooklyn, N. Y. The Standard Oil Co. is in the market for hand power cranes for Bayonne, N. J., and Charleston, N. C. Recent inquiries are from the Foundation Co., New York, a 10-ton overhead traveling crane for the plant of the Dunlop-America Co., near Buffalo, N. Y.; the Bethlehem Steel Co., South Bethlehem, Pa., a 30-ton locomotive crane; the Central Foundry Co., New York, two 5-ton overhead traveling cranes; the Spicer Mfg. Co., South Plainfield, N. J., a 7½-ton gantry crane; John Swensen, Concord, N. H., a 20-ton overhead traveling crane; the United Phosphate & Chemical Co., Richmond, Va., a second-hand 8-wheel, 75-ft. boom locomotive crane with a lift of four long tons; the Rapier Exporting Co., 50 Church Street, New York, a second-hand 15 to 20-ton locomotive crane, 50-ft. boom; the Giant Engineering & Commerce Co., Singer Building, New York, an overhead traveling crane for export to France; and the Baldwin Locomotive Works, two 10-ton overhead traveling cranes.

Among recent sales are 18 5-ton overhead traveling cranes, totaling about $122,000, purchased by the American Brass Co. for its new Buffalo plant from the Pawling & Harnischfeger Co.; the National Enameling & Stamping Co., Granite City, Ill., a 40-ton, 44-ft. 6-in. span overhead traveling crane with 15-ton auxiliary from the Champion Engineering Co.; John Hogan & Co., Philadelphia, seven 2-ton, 24-ft., span underhung transfer cranes from the Shepard Electric Crane & Hoist Co.; the Public Service Electric Co., Newark, N. J., 25-ton locomotive crane from the McMyler-Interstate Co.; the Federal Shipbuilding Co., Kearny, N. J., one 5-ton 26-ft. 10-in. span overhead traveling crane from the Pawling & Harnischfeger Co.; the Mutual Chemical Co., New York, 4-ton grab bucket crane from the Niles-Bement-Pond Co.; the Dewey Portland Cement Co., Kansas City, Mo., 30-ton 35-ft. 6-in. span hand power crane, the Ducktown Sulphur Copper & Iron Co., Ltd., Copper Hill, Tenn., 30-ton 23-ft. span hand power crane, and the Duratex Co., Newark, N. J., a 10-ton about 30-ft. span hand power crane from the Chisholm-Moore Mfg. Co.

The Standard Flexible Conduit Corporation, manufacturer of armored cable, flexible metallic tubing, etc., 158 Eleventh Avenue, New York, plans to go more deeply into the flexible tubing business. Harry Schimmel, cotton waste broker, is director and president; J. H. Rosenfield for six years a manufacturer of cable, is vice-president; Henry Schimmel, attorney, 302 Broadway, is treasurer, and Edward Rosenfield, mechanical engineer, is secretary.

The Nathan Mfg. Co., 416 East 106th Street, New York, manufacturer of steam specialties, etc., is planning the installation of new machinery in connection with the concentrating of its manufacturing operations at this location.

The Rohr-Schanck Oil Burner Corporation, Brooklyn, has been incorporated with a capital stock of $10,000 by S. P. Cohen, W. P. Lowe and J. E. Worthington, Jr., 120 Broadway, to manufacture oil burners and other heating devices.

The Continental Can Co., 616 West Forty-third Street, New York, has awarded a contract to Grange & Sloan, 527 Fifth Avenue, for its new four-story plant and power house at Fifteenth, Sixteenth, Cole and Monmouth streets, Jersey City, N. J., to cost with equipment about $700,000.

The Federal Bearing Co., Poughkeepsie, N. Y., has awarded a contract to Fred T. Ley & Co., Springfield, Mass., for a new four-story plant, 105 x 137 ft., on Lake Street, for the manufacture of ball bearings, etc.

The Port Washington Shipyard & Motor Co., Port Washington, N. Y., has been incorporated with a capital stock of $30,000 by E. V. Willis, A. Walker and F. M. Caughey, to operate a shipbuilding plant and repair works.

The Saniphone Co., New York, has been incorporated with a capital stock of $100,000 by J. P. Berg, S. T. Baer and J. G. Browne, 280 Broadway, to manufacture metallic mouthpieces.

The Frederick Osann Co., 245 Seventh Avenue, New York, manufacturer of sewing machinery, has increased its capital stock from $200,000 to $1,000,000.

The Army Department, Washington, is taking bids for a machine and repair shop at the proposed Air Coast Defense Station, Staten Island, N. Y., in connection with a total of about 28 buildings to form the entire plant. The Construction Officer, Army Building, 39 Whitehall Street, New York, is in charge.

H. W. Cotton, Inc., 233 Broadway, New York, manufacturer of machinery, has increased its capital stock from $600,000 to $1,300,000.

The Vapor Car Heating Co., 30 Church Street, New York, has been reorganized with an active capital of $1,098,000.

The Automatic Straight Air Brake Co., 14 Wall Street, New York, has increased its capital stock from $25,000,000 to $30,675,000.

The Farm Equipment Co., Flemington, N. J., has been incorporated with a capital of $50,000 by Frederick C. Updike, Paul S. Gallena and Garret J. Oldis, to manufacture farm implements and equipment.

The Central & South American Telegraph Co., 89 Broad Street, New York, is planning a plant for the manufacture and repair of cable instruments at Essex Fells, N. J.

The Wirebounds Corporation, 19 West Forty-fourth street, New York, has acquired the former plant of the Liberty Cycle Co., Rockaway, N. J., including about 2 acres adjoining. It will establish a new plant for the manufacture of wire for binding bales, barrels, cases, etc. The existing buildings will be remodeled at a cost of about $15,000, and machinery installed. It is expected to place the plant in operation late in the spring.

Fire, Feb. 26, destroyed a portion of the main building of the Peerless Insulated Wire & Cable Co., Pennington, N. J., with loss of about $5,000.

The International Nickel Co., Constable Hook, Bayonne, N. J., will build a new pumping plant at its works to cost about $40,000.

Echelman Brothers, 340 Newark Avenue, Jersey City, N. J., have filed notice of organization to manufacture tinsmithing specialties. Morris Echelman heads the company.

Fire, Feb. 26, destroyed the plant of the George W. Travers Co., Fifteenth Street, Hoboken, N. J., manufacturer of infants' carriages, toys, etc., with loss estimated at $200,000.

A new power plant, 20 x 54 ft., will be erected by the Whitelock Cordage Co., Communipaw Avenue, Jersey City, N. J., with boiler, turbine and auxiliary operating equipment installation, in connection with a four-story factory addition.

The American Spring Mfg. Co., 192 Railroad Avenue, Jersey City, N. J., has had plans prepared for a two-story plant addition.

The Arrow Iron Works, New York, has been incorporated with a capital stock of $10,000 by S. Tobias, L. Schildorout, and B. Goldberg, 610 East 133rd Street, to manufacture iron and steel specialties.

The Balch Body Corporation, Utica, N. Y., has been incorporated with a capital stock of $25,000 by F. W. and F. E. Balch, and H. J. Dillenback, to manufacture automobile bodies.

The Mechanical Weights Manufacturers, Inc., 27 West Eighth Street, New York, has filed notice of dissolution.

Fraser, Brace & Co., 1328 Broadway, New York, has commenced the erection of its shipbuilding plant and repair works at Clifton, Staten Island, to cost in excess of $2,000,000, including machinery.

The Auto-Automatic Signal Co., Brooklyn, has been incorporated with a capital stock of $40,000 by G. & R. A. Gnam and C. F. Marston, 2230 Tilden Avenue, to manufacture signal devices.

The United Wire Goods Mfg. Co., New York, has been

incorporated with a capital stock of $20,000 by J. Postal, L. Schulbert and M. Halpern, 78 East 127th Street, to manufacture wire and metal goods.

The Pollack Conduit & Electrical Supply Co., New York, has been incorporated with a capital of $20,000 by L. Pollack, and M. Simon, 205 Twenty-fifth Street, to manufacture electrical conduits and equipment.

The Audrey Motors Corporation, New York, has been incorporated with a capital stock of $500,000 by H. P. Friedman, H. P. Clarke and H. J. Liebeskind, 200 Fifth Avenue, to manufacture automobile motors.

The Alloy Foundry & Machine Corporation, New Rochelle, N. Y., has been incorporated with a capital stock of $50,000 by J. Grave, W. E. Welheim and A. C. Wakeling, to manufacture metal castings and machined products.

The Couch-Hass Motors Corporation, 1637 Redfield Avenue, Brooklyn, has commenced the erection of a new automobile manufacturing plant at Henry, Ely and Williams streets, Long Island City, N. Y.

The Skinderviken Electrical Co., New York, has been incorporated with a capital stock of $35,000 by J. Skinderviken, H. E. Goldsmith and M. Moskowitz, 1265 Broadway, to manufacture telephone and telegraph apparatus.

The Glasgow Iron Works & Supply Co., 28 West Street, New York, has increased its capital stock from $28,000 to $84,000.

The Adjusto Mfg. Co., Brooklyn, has been incorporated with a capital stock of $40,000 by Edward N. Smith, Burant J. Thompson, Brooklyn, and H. A.. Stewart, New York, to manufacture adjustable metal frames for automobile wind shields, etc.

McNeely & Sherry, Inc., Jersey City, N. J., has been incorporated with a capital stock of $100,000 by William P. McNeely, Laurence Sherry and Harry P. Stewart to manufacture metal-bound casks, barrels, etc.

Dietz & Schuman, 34 Marshall Street, Newark, N. J., have filed notice of organization to manufacture tools. Charles A. Dietz, 71 Cummings Street, Irvington, heads the company.

The James T. Clark Co., 70 Adams Street, Newark, N. J., manufacturer of iron castings, has filed plans for improvements in its foundry to cost about $22,000.

The Peerless Tube Co., Bloomfield, N. J., manufacturer of collapsible tubes, will let contracts within the next week or so for a new building of 77,000 sq. ft. with a separate heating unit, to provide for increased output.

The Acme Storage Battery Corporation, Poughkeepsie, N. Y., which recently increased its capital stock from $100,000 to $175,000, has changed its principal product from house lighting batteries to starting and lighting batteries of the automobile type.

New England

BOSTON, March 9.

The slowing up in machine-tool buying noted a week ago was largely due to weather conditions. During the past week the local market has been sufficiently active to bring the total bookings for the first eight days of the month slightly above those for the corresponding periods in January and February, not only in the number of tools sold but in the gross value. The present activity is all the more significant inasmuch as the General Electric Co., Lynn, was the only large user to place orders the past week, and its purchases have been comparatively small.

Buying by the United Shoe Machinery Co., Beverly, Mass., is checked by labor troubles, and no inclination to purchase against its 1920 requirements is shown by the Worthington Pump or other large interests. There are, however, several lists out representing investments of $25,000 to $75,000, which with many smaller requirements account for the present activity. Local tool representatives have been informed of cancellations in other sections of the country, especially in the Middle West, but no similar condition is noticeable here.

The transportation situation is a little better than prior to the return of the railroads to private ownership, but it will be several weeks before the movement of freight is normal. Local railroads removed all embargoes on small and large shipments March 2, and on March 3 were swamped with business. Deliveries of tools therefore are just so much further extended.

Prices continue very strong with further advances recorded. In the past week or 10 days a New England company advanced prices on upright drills and a Central Western maker of radial drills advanced from 10 to 12 per cent. Miscellaneous small tools have been marked up 10 per cent. One leading manufacturer of sensitive drills notified local representatives that prices will be advanced 15 per cent March 15. Motors have risen 10 per cent.

Stone & Webster, Boston, are still buying against their list for a Hartford plant, and the Murray & Tregurtha Co., Neponsit, Mass., marine engines, has not covered its full requirements. Contrary to earlier reports, the Crofoot Gear Works, Cambridge, Mass., has not completed purchases, but has a fairly large list against which some specifications have been made. The Saco-Lowell Shops, Boston, are still in the market and the past week consulted on some heavy duty tools. The D. E. Whiton Machine Co., New London, chucks, etc., is buying production lathes, and John L. Whiting, Boston, brushes, bought a lathe and other tools against his 1920 list, which is fairly large. The H. B. Smith Co., Westfield, Mass., boilers, etc., is interested in equipment, and the Blanke Twist Drill & Tool Co., Taunton, Mass., is buying against a list, which may total $50,000. The Chapman Valve Mfg. Co., Indian Orchard, Mass., is placing orders, and it is anticipated that the Watertown Arsenal, which has considerable money to spend before July 1, will be interested in heavy duty tools and possibly cranes in the near future. The Fales & Jenks Machine Co., Pawtucket, R. I., cotton mill machinery, has bought some production lathes. The Phoenix Mfg. Co., Lowell, Mass., pistons, etc., has purchased production equipment, and the Rogers Drop Forge Co., Worcester, Mass., four steel hammers, while Walden-Worcester,, Inc., of the same city, bought a line of automatic screw machines. The Norton Co., Worcester, grinding machines, in one day bought several lathes, a shaper and other equipment. The Hurlburt-Rogers Machinery Co., South Sudbury, Mass., cutting off machines, has figured in the week's purchases. Several Attleboro, Mass., jewelry manufacturers, as well as wood-working concerns in Boston and elsewhere, have placed orders for lathes. Scott & Williams, Laconia, N. H., knitting machines, have also purchased lathes. Jones Bros. & Co., Barre, Vt., granite, are in the market for four 40-ton cranes, and several other concerns are about to close on similar equipment. A Vermont power company bought a 40-ton crane, and the Boston & Maine Railroad is interested in heavy duty cranes. The Boston & Albany Railroad purchased a steam wrecking crane, weighing 246,000 lb. with a maximum lifting capacity of 160 tons, for its West Springfield, Mass., yards.

The Diamond Match Co. will erect a large plant at Springfield, Mass., on a 40-acre site adjoining the New Haven Railroad on Summer Avenue. It will be mainly confined to the preparation and completion of processes for its plants in other parts of the country. The first unit to be erected will have 300,000 sq. ft. of floor space.

The Bullard Engineering Co. plans to erect a one-story, 90 x 210 ft. forge shop at Black Rock, Conn., in the spring, to cost approximately $75,000. A traveling crane, etc., will be installed.

The H. A. Matthews Mfg. Co., Seymour, Conn., ball bearings, sheet metal stamping, etc., has increased its capitalization from $400,000 to $1,000,000 and contemplates the immediate erection of additions to its plant.

A contract has been let by the Bridgeport Casting Co., Bridgeport, Conn., for rebuilding its foundry, which is one-story, 112 x 193 ft. The estimated cost is $65,000.

The Greene Carburetor Co., Boston, capitalized for $50,000, has been chartered. It has a contract for the manufacture of a gasoline carburetor, and is negotiating for a plant. Walter T. Greene, 336 Belgrade Avenue, Roslindale, is president, and Henry J. Barry, 40 Court Street, Boston, treasurer.

The Petroleum Heat & Power Co., Boston and New York, formerly the Fess Rotary Oil Burner, Inc., has leased the four-story building at 45-49 Washington Street, North Boston, but will continue to turn out both high and low pressure oil burners at 77 Washington Street, North. When its new plant at Stamford, Conn., is completed and in operation, which is expected within two months, its two local shops will be moved there, but sales and installation department will be maintained at 100 Boylston Street, Boston. The company has practically covered its machine tool requirements, but is still open for a few special items.

The Anderson Motor Corporation, 116 Robbins Street, Waltham, with a capitalization of $10,000, has been chartered to conduct a general foundry and machine shop business. It is a successor to Anderson & Co., manufacturers of automatic carburetor attachments for Ford cars and of automobile specialties. The new company will specialize in an automatic air adjuster, gasolene strainer and a heating device. The management contemplates securing new and enlarged quarters within the near future and the manufac-

ture of marine engines and a die holder will be undertaken. Andres A. Anderson is president and treasurer.

Plans will be ready within a short time for a new three-story manufacturing plant, 43 x 240 ft., to be erected by the Trimont Mfg. Co., Roxbury, Boston.

The Connecticut branch of the Westinghouse Lamp Co. is to be converted into a plant for the manufacture of about 80,000 miniature electric lamps per day. The working force will practically be doubled, totaling about 500.

The American Woodworking Machinery Co., Rochester, N. Y., has sold its three-story factory at Norwich, Conn., to William W. Semple, Jr., and others.

Bids are being submitted for a four-story, 52 x 90 ft. brick addition to the plant of the Miller Brothers Cutlery Co., Meriden, Conn.

The Yokel Corporation, recently organized under Connecticut laws, has secured property on Homestead Avenue, Hartford, Conn., upon which a new plant will be built in the near future. It will manufacture and design lighting fixtures.

The formal transfer of the Remington Arms U. M. C. Co., Inc., Bridgeport, Conn., has been made in three transfers, the first machinery and equipment to the Fairfield Liquidation Co., Inc., for a consideration of $1,000,000; the second to the Bridgeport Liquidating Co., Inc., real estate, for $1,700,000; and the third to the East End Realty Co., 47 pieces of land for $3,000,000.

The Worcester Electic Light Co. will enlarge its power plant by the installation of boilers totaling 20,000 hp., bringing the total generating capacity to 70,000 hp. No new generators will be required. The boilers will be served by automatic stokers and all other appurtenances will be of the most modern labor and fuel saving types. A locomotive crane will be purchased.

The Union Horse Nail Co., New Haven, Conn., has filed notice of change of name to the Fowler & Union Horse Nail Co.

A power plant to cost about $100,000 with equipment will be erected by the Fitzdale Paper Co., Fitzdale, Vt. John F. King, is treasurer

The Crosby Steam Gauge & Valve Co., 40 Central Street, Boston, Mass., is having plans prepared for a one-story brick and steel foundry addition, 48 x 104 ft., to cost about $30,000. Lockwood, Green & Co., 60 Federal Street, are engineers.

The Beaudet Mfg. Co., Woonsocket, R. I., has been incorporated with a capital of $100,000 by George A. Beaudet and Eugene L. Jalbert, to manufacture cutting and welding equipment, torches, etc.

The Mason Regulator Co., Adams Street, Boston, Mass., manufacturer of valves, injectors, etc., has awarded a contract to the J. T. Scully Foundation Co., First Street, East Cambridge, for the erection of a two-story addition to cost about $30,000.

The Chapman Machine Co., Terryville, Conn., has increased its outstanding capital stock to $120,000.

The Board of Education, Hartford, Conn., has plans under way for a new industrial school to cost in excess of $1,000,000, with equipment. The different departments will include machine shop, electrical and wood-working shops, chemical departments, etc. Whiton & McMahon, 36 Pearl Street, are the architects.

Philadelphia

PHILADELPHIA, March 8.

Indications are that some of the railroads will buy second-hand tools to meet their urgent requirements. Some of the Southern roads have already inquired here for used tools, wanting immediate delivery. Machine-tool salesmen who have canvassed the railroad shops in this territory find that the master mechanics and shop superintendents all voice the great need of new equipment, but in most instances no appropriations have yet been provided for purchases.

The Bateman Mfg. Co., Grenloch, N. J., will manufacture a dust-sprinkling machine, which will be used in the Southern cotton fields to destroy boll-weevil. The machine has been thoroughly tested by the Department of Agriculture.

The Tabor Mfg. Co., Eighteenth and Hamilton streets, Philadelphia, manufacturer of molding machines, etc., has awarded a contract to John N. Gill & Co., Otis Building, for a one-story brick addition at State Road and Deverow Street, 30 x 106 ft., to cost about $18,000.

The American Manganese Bronze Co., Rhawn and Hegerman streets, Philadelphia, has filed plans for a one-story foundry extension, 24 x 60 ft.

The plant addition for the Precision Grinding Wheel Co., Torresdale Avenue, Holmesburg, Pa., will be two-stories, instead of one-story, as previously announced, 96 x 298 ft., and will be equipped as a machine shop. Estimates for construction are now being taken.

The Commercial Truck Co., Twenty-seventh and Brown streets, Philadelphia, manufacturer of motor trucks, has filed articles of incorporation with a capital stock of $4,000,000.

The Brown Instrument Co., Wayne and Windrim streets, Philadelphia, manufacturer of pyrometers, etc., has filed plans for a two-story concrete addition, 44 x 126 ft., to cost about $35,000. A second addition of similar type, two-stories, 37 x 72 ft., will be erected at a cost of about $22,000.

Spayd's, Inc., Edgehill, Pa., has been incorporated with a capital stock of $50,000 by H. C. M. Spayd, Edgehill; Frances Neal, Philadelphia; and Harry C. Bye, Wilmington, Del., to manufacture typewriter parts.

The National Pipe & Supply Co., Haverford, Pa., has been incorporated in Delaware with capital stock of $1,000,000 by Frank A. Cabeem, Jr., Haverford, M. Elliott and Wray C. Arnold, Commonwealth Building, Philadelphia, to manufacture pipe, fittings, etc.

The Merchant Shipbuilding Corporation, Chester, Pa., has increased its capital from $22,000,000 to $32,000,000. The company has taken a contract for the construction of two steel tankers at its local yard for the Union Oil Co., 120 Broadway, New York, each of 12,500 tons rating.

The Niedt-Ertel Motor Co., 350 South Broad Street, Trenton, N. J., is planning for a three-story service and repair works, 75 x 100 ft., on South Broad Street, to cost $75,000.

The Victor Talking Machine Co., Camden, N. J., has had plans prepared for a plant addition.

The American Metallurgical Corporation, 20 South Fifteenth Street, Philadelphia, has increased its capital stock from $50,000 to $250,000.

The Crescent Insulated Wire & Cabble Co., Olden and Taylor streets, Trenton, N. J., has filed plans for an addition, 50 x 150 ft. C. Edward Murray is president.

The Camden Motors Corporation, Collingswood, N. J., has inaugurated operations at its new local plant for the manufacture of ½-ton front-drive motor trucks. Frank Bateman is president; E. S. Bateman, vice-president; and Fred H. Bateman, general manager.

Roy Adams, Somerset, Pa., associated with the Somerset Garage & Machine Co., is having plans prepared for a new one-story foundry and machine shop, 50 x 180 ft., to cost $15,000.

The Sheldon Axle Co., Scranton, Pa., has completed plans for a three-story addition, 100 x 200 ft., on Beaumont Street, to cost about $200,000.

The Olyphant Foundry Co., Blakely, Pa., has been incorporated with a capital stock of $10,000 by Jacob Baldinger and associates, to manufacture iron, steel and other metal castings.

The Glass Casket Corporation, Altoona, Pa., will install a department for the manufacture of metal carriers. S. W. Manning is president.

The Advanced Products Corporation, Cynwyd, Pa., has been incorporated with a capital stock of $250,000 by Thomas Sanders, Jr., Cynwyd, and A. R. Van Orsdale, Philadelphia, to manufacture automobile parts.

The Bethlehem Motors Co., Allentown, Pa., manufacturer of motor trucks, has awarded a contract to George H. Hardner, Lentz Building, for a one-story plant addition, 80 x 380 ft., to cost $100,000 including equipment. Hiram F. Harris is president.

A one-story power plant, 40 x 70 ft., will be erected for works service by Louis Roessel & Co., Hazleton, Pa.

The North Lebanon Foundry Co., Lebanon, Pa., has increased its capital stock from $10,000 to $60,000

The one-story addition, 90 x 200 ft., to be erected by the Vulcan Iron Works, 730 South Main Street, Wilkes-Barre, Pa., on Hazel Avenue, will be equipped as a locomotive shop. The company specializes in the manufacture of engines, heavy machinery, etc. The new shop will cost about $125,000, including equipment.

The Bethlehem Plumbing Supply Co., Bethlehem, Pa., has been incorporated with a capital stock of $250,000 by Dallett H. Wilson, Edward A. Grote and Howard A. Lehman to manufacture brass goods, plumbers' metal specialties, etc.

Buffalo

BUFFALO, March 8.

The Farrel Foundry & Machine Co., Ansonia, Conn., is planning for the erection of a new forge shop at its Buffalo plant on Vulcan Street. The company is now installing machinery and plans to inaugurate operations early in April for the manufacture of rubber-mill machinery, rolls, etc. At a later date, a broader line of manufacture will be arranged, including sugar-mill machinery.

The Spillman Engineering Corporation, North Tonawanda, N. Y., has been incorporated with a capital stock of $100,000 by G. H. Cramer, E. O. and A. H. Spillman, to manufacture machinery and parts.

The Crosby Co., 183 Pratt Street, Buffalo, manufacturer of steel and metal stampings, has completed plans for a one-story addition, 48 x 125 ft., at 300 William Street, to cost $10,000.

The Hays Mfg. Co., Twelfth and Liberty streets, Erie, Pa., manufacturer of brass and bronze products, is completing plans for a two-story addition, 55 x 115 ft., at Twelfth and Peach streets, to cost $75,000. William Forster is president.

The J. H. Allen Automatic Machinery Corporation, Rochester, has been incorporated with a capital stock of $200,000 by L. J. Fess, H. U. Maring and J. H. Allen to manufacture special machinery and parts.

The Yawman & Erbe Mfg. Co., 424 St. Paul Street, Rochester, N. Y., manufacturer of metal filing cabinets, etc., has awarded a contract to the White Construction Co., 95 Madison Avenue, New York, for a three-story and basement reinforced-concrete plant, 137 x 250 ft., to cost $400,000. It will form the initial unit of the company's proposed $2,000,000 plant additions. Gustav Erbe is treasurer.

A complete equipment of machine tools will be installed in the new plant of the Syracuse Washer Co., Syracuse, N. Y., manufacturer of washing machinery. The new plant is estimated to cost close to $1,000,000. Contract for the building was awarded recently to the Hedden Iron Construction Co., 30 Church Street, New York, under special design of a one-story saw-tooth roof building, 300 x 700 ft. Ford, Bacon & Davis, 115 Broadway, New York, are the engineers.

The United States Fire Extinguisher Co., Syracuse, N. Y., has been incorporated with a capital stock of $250,000 by R. B. Seagfrid, L. Brown and A. C. Mead, East Syracuse, to manufacture fire extinguishers.

The Buffalo Hardware & Foundry Co., 747 Hertel Avenue, Buffalo, is planning for a one-story addition to cost $15,000.

The Tonawanda Power Co., North Tonawanda, N. Y., has increased its capital stock from $750,000 to $2,000,000 for extensions.

The Denlinger Lamp & Ignition Co., Syracuse, N. Y., has been incorporated with a capital stock of $12,000 by C. J. Bennett, F. A. Brown and M. G. Denlinger, to manufacture ignition equipment and automobile accessories.

Plans for a new fertilizer plant to cost about $500,000 including equipment, to be located on Lyell Avenue, Rochester, N. Y., are being considered by the Virginia-Carolina Chemical Co., 120 Broadway, New York.

The Hudson Brass Works, 16 Nassau Street, Brooklyn, N. Y., is having plans prepared for a one-story and basement plant on Ford Street, Ogdensburg, N. Y., 100 x 300 ft., to cost $65,000. The new works will be operated in the name of the Cooper Brass Works, recently incorporated with a capital of $200,000. A. Cooper heads both organizations.

The E. H. Titchener & Co., wire works, Binghamton, N. Y., is reported arranging for the sale of its local two and three-story plant, comprising about 22,500 sq. ft. of space for manufacture.

The John W. Cowper Co., Buffalo, has been awarded contract by the American Radiator Co. for a steel foundry addition to its plant at Elmwood Avenue and New York Central Belt Line at a cost of $50,000.

The Buffalo Pressed Steel Co., Kensington Avenue and the Erie Railroad, Buffalo, has increased its capital stock from $1,000,000 to $1,125,000.

The U. S. Light & Heat Corporation, Niagara Falls, N. Y., has placed contract with the John W. Cowper Co., Buffalo, for an addition to its acid plant at Highland Avenue and the New York Central Railroad to cost about $50,000.

Plans are being prepared for a foundry, 64 x 175 ft., by the Continental Heater Co., Dunkirk, N. Y., at an estimated cost of $25,000.

The Tompkins Bros. Co., Troy, N. Y., machinist, is having a one-story addition, 72 x 280 ft., made to its factory on Oneida Street by the Owego Bridge Co. at a cost of $35,000.

The John W. Cowper Co., Buffalo, has received contract for an addition to the plant of the National Carbon Co., College Avenue and New York Central Railroad, Niagara Falls, N. Y., to cost about $100,000.

Pittsburgh

PITTSBURGH, March 8.

The Pittsburgh Testing Laboratory, Pittsburgh, is planning the early removal of its works to the building on Seventh Avenue occupied for the past few years by the Government.

The Ambridge Tool & Die Mfg. Co., Ambridge, Pa., has been incorporated with a capital stock of $20,000 to manufacture tools, dies, etc. Charles F. Messmer, Fair Oaks, is treasurer.

The United States District Court, Pittsburgh, has confirmed the sale of the coal properties of Josiah V. Thompson to the Piedmont Coal Co., for a consideration of approximately $5,000,000.

The Cambria Auto Co., 230 Bedford Street, Johnstown, Pa., has leased a two-story service and repair works, 110 x 150 ft., to be erected at Somerset and Franklin streets, at a cost of $100,000.

In connection with the 800-ft. coal and coke wharf to be erected by the Pittsburgh Steel Co., Monessen, Pa., unloading and hoisting apparatus, belt conveyor system, etc., will be installed.

The Progress Watch & Clock Co., Farrell, Pa., has been incorporated in Delaware with a capital stock of $150,000 by Alexander Howath, Albert Wise and Samuel Krause to manufacture watch and clock movements and precision apparatus.

The Keystone Die & Mfg. Co., Pittsburgh, has leased the three-story building, 50 x 51 ft., at Burd and Erie streets, for a local works.

The Federal Enameling & Stamping Co., McKees Rocks, Pa., has completed plans for a two-story addition on Chartiers Street, 40 x 80 ft., to cost $10,000.

The Central Glass Works, Wheeling, W. Va., is considering the erection of a gas producer plant. Howard Hazlett is president.

The National Insulating Co., Lamberton, Ohio, is planning for a new plant, 80 x 216 ft., on a recently acquired site at Parkersburg, W. Va.

The Warrenton Electric Light & Power Co., Warrenton, W. Va., is planning for the installation of new boiler, generator, and general operating machinery. M. J. O'Connell is manager.

The Lilly Draw-Cut Plow Co., Charleston, W. Va., has been incorporated with a capital stock of $100,000 by W. T. Lilly, Beckley; J. A. Lilly, Glen Morgan, and W. G. Barnhart, Charleston, to manufacture agricultural implements.

Baltimore

BALTIMORE, March 8.

A four-story plant, 100 x 400 ft., for the manufacture of motor trucks will be built at Laurel, Md., by the Maryland Motors Corporation, Baltimore, which has been organized with $2,000,000 capital stock. It also is planned to furnish power for a lighting plant for the town, a pumping plant, an ice-making plant and a sewerage disposal plant. The officers of the company are Paul J. Prodoehl, Munsey Building, Baltimore, president; T. B. Webster, vice-president; Howard G. Clark, secretary and treasurer; I. C. Baker, chief engineer; John H. Kunkel, J. H. Ellard and C. W. Ludwig.

The Robins Peerless Granite Tub Co., which has plants at Brooklyn, N. Y., and Weehawken, N. J., has acquired a building at Twenty-third and Sisson streets, Baltimore, where another plant for the manufacture of laundry trays will be established. The initial yearly output will be about 10,000. It is planned to begin operation about April 1. H. W. Cook, vice-president, will manage the Baltimore plant.

The Lynchburg Foundry Co., Lynchburg, Va., plans to build a plant for the manufacture of cast-iron pipe.

The Union Iron Works, Norfolk, Va., will install lathes, planers, radial drills, etc.

The Martinsville Motor Co., Martinsville, Va., will install repair equipment. C. V. Ferguson is manager.

With $100,000 capital stock, the No-Drip Faucet Co., 6 Clay Street, Baltimore, has been incorporated by W.

Monroe Schmidt, Benjamin H. McDuffie and Maye M. Swihart to manufacture a patent faucet.

The Autogenous Welding & Machine Co., 1217 Maryland Avenue, Baltimore, has awarded a contract to Frank Condon, Baltimore, for a plant addition, 25 x 150 ft., to cost $12,000.

The Baltimore Brass Co., Wicomico Street near Ostend Street, Baltimore, has been incorporated with $250,000 capital stock to operate a rolling mill to roll brass, copper and other metals. The incorporators are Frank B. Ober, Robert W. Williams and Albert R. Stuart.

The Radio Engineering Co., 827 Madison Avenue, Baltimore, has been incorporated with $25,000 capital stock by Charles E. King, Edward B. Duvall and Peter Peck to manufacture wireless supplies, electrical goods, etc.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, has plans under way for its proposed electric power plant, one-story, 75 x 150 ft., at Westport, Md., to cost $60,000.

The Potomac Electric Power Co., Washington, D. C., is planning for a new electric power plant at 510 Tenth Street, Northwest.

The duPont Motors, Inc., Wilmington, Del., is having plans prepared for its new plant at Moore, Pa., near Philadelphia, where a site of about 8½ acres has been secured, on the line of the Philadelphia, Baltimore & Washington Railroad. The initial building will be two stories, of brick and steel, 75 x 790 ft., to be used for assembling and finishing, it being the intention to maintain the present plant at South Wilmington for engine and chassis construction. The company will specialize in the manufacture of two models of pleasure cars, a four-passenger touring car and two-passenger roadster. E. Paul duPont is president and John A. Pierson, chief engineer.

The Modern Electric Welding Co., 915 South Ann Street, Baltimore, has been incorporated with a capital stock of $100,000 by John M. Hoffman, Daniel J. Lynch and Milton Roberts, to manufacture welding apparatus, etc.

Walter F. Kneip, Baltimore, has filed plans for a two-story automobile service and repair building, 40 x 150 ft., at 1122 North Charles Street, to cost $60,000.

The L. W. Gunby Co., Salisbury, Md., manufacturer of cornices, etc., has increased its capital stock from $150,000 to $500,000.

The Delaware Railroad Co., Georgetown, Del., is planning for a new central repair shop at Clayton, and for the concentration of its repair operations at this point.

T. B. Taylor and J. O. Douglas, Alma, Ga., are organizing a company for the establishment of a local plant for the manufacture of automobile truck bodies.

Machinery to cost about $100,000 will be installed in the proposed new paper box manufacturing plant to be established by Montag Brothers, 182 Marietta Street, Atlanta, Ga. A building, 80 x 165 ft., will be remodeled to accommodate the new works, and the installation will include power and lighting plant, electric elevators, etc., estimated to cost in all about $200,000.

The Greenville Iron Works, Greenville, S. C., will establish a plant for the manufacture of gray-iron and brass. W. L. Wilson is manager.

The Eastham Soil Pipe & Foundry Co., Anniston, Ala., has been incorporated with $75,000 capital stock. J. M. Eastham is president and H. S. Miller, secretary.

The Etowah Foundry & Machine Co., Gadsden, Ala., has been organized. E. J. Owen is general manager.

The Tuscaloosa Machinery Exchange, Tuscaloosa, Ala., will receive quotations on lathes, drills and welding and cutting equipment.

Prices on drill presses and lathes are wanted by the McClure Motor Co., 2020 Avenue B, Birmingham, Ala. E. D. Bobbs is secretary.

Indianapolis

INDIANAPOLIS, March 8.

The Dean Brothers Steam Pump Works, 323 West Tenth Street, Indianapolis, has awarded a contract to J. W. & William Martin, 3551 Ashland Avenue, for two additions to its plant, 27 x 130 ft., and 50 x 125 ft., to be equipped as a machine shop and for general manufacture respectively. The extensions will cost about $50,000.

The Criterion Motors Co., Indianapolis, has been incorporated with a capital stock of $1,000,000 under Delaware laws by Walter J. Leinbach, Victor R. Chandler and E. Edward Dean, Indianapolis, to manufacture automobiles.

The Kendallville Foundry Co., Kendallville, Ind., is taking bids for the erection of a one-story addition to cost about $30,000.

The Preferred Motor Car Co., Indianapolis, has been incorporated in Delaware with a capital stock of $2,000,000 by Ira Chase Koshne, Louis Lescuson and S. C. Bodner to manufacture automobiles.

The Columbian Enameling & Stamping Co., Terre Haute, Ind., has awarded a contract to Raehn Brothers, Terre Haute, for a one-story addition on Beach Avenue, 155x240 ft., to cost about $50,000.

The C. Spiro Mfg. Co., a New York corporation, has leased part of the former plant of the Diamond Chain & Mfg. Co., Indianapolis, and will establish works for manufacturing running boards for automobiles. A factory will be erected later.

The Apex Mfg. Co., Indianapolis, has been incorporated with $10,000 capital stock to manufacture machinery. The directors are John Murphy, George Shepherd and F. J. Montani.

The recent increase in capital stock of the William Small Co., Indianapolis, from $1,0000,000 to $3,000,000, is partly to enable the company to erect a new building for the manufacture of automobiles at Belmont Avenue and Washington Street. It now operates a motor and axle plant and an assembling and finishing works. W. G. Todd is secretary.

Officers of the Evansville Coil Spring Co., Evansville, Ind., recently organized, are: President, George C. Bruner; vice-president, John Genpfer; treasurer, Charles Carlton; secretary and general manager, Herman O. Reibenach.

The Mark Mfg. Co., East Chicago, Ind., has placed an order for 1500 tons of structural steel for the construction of a new machine shop.

The Superior Machine Tool Co., Kokomo, Ind., has increased its capital stock from $450,000 to $500,000.

The Hydro Electric Light & Power Co., Connersville, Ind., has increased its capital stock from $750,000 to $1,125,000.

The Anderson Machine & Tool Co., Anderson, Ind., has been incorporated with $150,000 capital stock. The directors are Henry P. Hardle, William H. Bozel and Paul A. Goldsmith.

The Superior Metal Weather Strip Co., Indianapolis, has been incorporated, with $45,000 capital stock. The directors are Henry S. Davis, James F. Grenway and Charles S. Drake.

Chicago

CHICAGO, March 8.

The return of the railroads to their owners, regarded in many business circles as a harbinger of heavy purchases, has not yet ushered in much buying in the machine tool field. It is feared in some quarters that the tight money situation may prove a potent obstacle to adequate appropriations for shop equipment. But, however, that may be, it is definitely known that mechanical departments are preparing extensive lists of their requirements which must be bought some time, if not immediately. One list by the Great Northern Railroad was sent out the past week and the Illinois Central, the Rock Island and the Burlington are carefully canvassing their needs. The Santa Fe is preparing an emergency list for which it hopes to secure an appropriation before June 1.

Great Northern List

One high duty 90-in. driver tire turning lathe, motor drive.

One 44-in. capacity vertical boring mill with single tool head.

One 30 in. x 30 in. x 6 ft. planer, belt drive.

One 20 in. x 12 ft. engine lathe.

One 20-in. high duty shaper.

One 36-in. heavy pattern round table upright drill with tapping attachment, belt drive.

One twist drill grinder, complete.

One 2-in. double bolt cutter.

One pipe-threading machine, capacity ½ in. to 4 in., with regular equipment.

One 125-ton Watson-Stillman or similar design, driving box press arranged for belt drive.

One double-end punch and shear, capacity ⅝-in. hole in ⅝-in. plate. 12-in. throat on punch end and 20-in. throat on shear end, belt drive.

One bending roll, 6 in. x 62 in. rolls, hand operated.

One Hendley & Whittemore 46½-in. alligator shears, capacity 2-in. rounds, belt drive.

One 600-lb. single frame steam hammer with foot treadle, Massillon or similar design.

One Whiting two-motor electric overhead traveling crane, capacity 5 tons, span 36 ft.

Two of the largest individual orders placed in this district for some time were closed the past week. One pur-

chase covers 23 18-in. x 10 ft. engine lathes and is expected to be followed in a few days by an order for 10 more. The other transaction involves 10 oil country lathes, including 26-in. x 16 ft., 26-in. x 18 ft., and 32-in. x 18 ft. machines. The Avery Co., Peoria, Ill., recently purchased about $10,000 worth of tools.

Notwithstanding these encouraging orders, the volume of inquiry has fallen off. The tight money situation makes it difficult for many consumers to finance new equipment. The automotive industry, however, continues to buy, the Nash Motor Co. and the Studebaker Corporation being among those continually adding to their equipment. The Samson Tractor Co., which has been one of the largest buyers in this section, has withdrawn from the market entirely. The American Bridge Co. is in the market for equipment.

The projected $40,000,000 plant of the National Tube Co. at Gary, Ind., is expected to include large machine shop facilities, but the tool purchases involved will probably be made in Pittsburgh, the headquarters of the company.

The Cobaltic Tool Co., a recently incorporated subsidiary of the Rich Tool Co., Chicago, has completed a plant at Michigan City, Ind., and will manufacture the line of cast-steel milling cutters and reamers, heretofore produced by the Rich company.

The World Phonograph Co., 736 Tilden Street, Chicago, has purchased a tract, 145 x 625 ft., on the northeast corner of Halstead and Forty-nine streets. It is improved with a three-story building which will be used for the manufacture of talking machines.

The D. O. James Mfg. Co., gear cutters, 1120 West Monroe Street, Chicago, will build a three-story annex, 48 x 120 ft.

The Western Campbell Ice Machine Co., Chicago, has purchased five acres on the Chicago, Milwaukee & St. Paul Railroad at Cornelia Street, and will erect an ice machine manufacturing plant. The cost of the first unit is estimated at $150,000.

Arnold Brothers, packers, 660 West Randolph Street, Chicago, have awarded a contract for the construction of a one-story machine shop, 48 x 100 ft., at 1742-44 Carroll Avenue, to cost $14,000.

The Guyton & Cumfer Mfg. Co. manufacturer of special machinery, 4451 Fillmore Street, Chicago, has awarded contracts for the erection of a two-story plant at the same address to cost $80,000.

The Joseph F. Kiesler Co., 929 West Huron Street, manufacturer of excavating buckets, has let contracts for a one and two-story factory, 68 x 75 ft., at 929-935 West Superior Street, to cost $15,000.

W. H. Hutchinson & Son, manufacturers of bottlers' machinery, 2101 Walnut Street, Chicago, have let contracts for a two-story plant, 50 x 126 ft., at 2100-2102 West Lake Street, to cost $45,000.

The International Molding Machine Co., 2634 West Sixteenth Street, Chicago, has let contract for the erection of front and side additions to its plant, 40 x 88 ft., 7610-14 West Sixteenth Street, to cost $37,000.

The Cribben & Sexton Co., stove manufacturer, 680 North Sacramento Avenue, Chicago, has let contract for a one-story nickel-plating room, 70 x 120 ft., at 735-47 North Albany Avenue, to cost $25,000.

The Peoria Malleable Castings Co., Peoria, Ill., has increased its capital stock from $175,000 to $250,000. Its plant will be enlarged.

B. L. Schmidt & Co., manufacturers of gasoline engines and appliances, Davenport, Iowa, have purchased a 3-acre tract on which it will erect a foundry and machine shop. The present quarters at 419 West Fourth Street have been outgrown.

Williams, White & Co., Moline, Ill., manufacturers of punches, shears and other heavy machinery, have awarded contract to the McClintic-Marshall Co., Pittsburgh, for a one-story foundry addition, 110 x 325 ft.

The Berle Mfg. Co., Davenport, Iowa, has been incorporated in Delaware with capital stock of $100,000 by E. Jacobson, R. G. Berle and D. G. Fisher, to manufacture coffee urns and general metal specialties.

The W. A. Sheaffer Pen Co., Fort Madison, Iowa, manufacturer of steel pens, etc., has increased its capital stock from $1,575,000 to $4,075,000.

D. R. Sperry & Co., Batavia, Ill., manufacturers of filter presses, etc., with plant at North Aurora, Ill., are considering the erection of a one-story foundry addition, 60 x 100 ft., to cost about $20,000.

The General Boilers Co., Tacoma, Wash., has been organized to take over the Pioneer Steel & Boiler Co., with local plant for the manufacture of steel portable return tubular boilers for low pressure work, hot water boilers, tanks, etc. The new company will establish its headquarters at Waukegan, Ill., where a new factory is now in course of erection. The Tacoma works will be continued to handle the Pacific Coast trade.

The Cleveland Steel Barrel Co., Meech Avenue, Cleveland, has taken bids for the erection of a one and two-story plant, 80 x 290 ft., and 45 x 80 ft., at Rosedale, Kan., to cost about $75,000. Brostrum & Drotts, Reliance Building, Kansas City, Mo., are the architects.

The Woodstock Typewriter Co., Woodstock, Ill., has had plans prepared for a one-story addition, 75 x 100 ft.

The Acme Steel Goods Co., 2834 Archer Avenue, Chicago, has completed plans for a one-story addition, 150 x 600 ft., to be used as a rolling and finishing department.

The State Normal School, Emporia, Kan., has had plans prepared for a one-story electric light and power plant 82 x 110 ft., to cost $70,000. R. L. Gamble, State House, Topeka, is State architect.

Cleveland

CLEVELAND, March. 8.

A Russian machinery dealer called on local machine tool manufacturers late last week and negotiated for the purchase of a large amount of machinery for Soviet Russia, the placing of this business being contingent upon the establishment of commercial relations between the Soviet Government and the United States. If this takes place, it is expected that the purchases of American machinery for a large Russian house with which the visitor is understood to be affiliated, will amount to several million dollars. At least two Cleveland machine tool builders were sufficiently impressed with the representations of the Russian visitor to enter into negotiations, although one company manufacturing forging machinery, from which he wanted 12 to 15 machines amounting to $100,000, declined to deal with him as its plant is sold up for months ahead, having more orders on its books at present than at any time during the war. From Cleveland the Russian went to Cincinnati to take up purchases with the machine-tool manufacturers in that city. Local machine tool business is exceedingly dull. Dealers report few sales and inquiries the past week, orders for the most part being for single machines. The Erie Bolt & Nut Co., Erie, Pa., came out with an inquiry for a round lot of bolt making and other machinery, which was the only inquiry of any size. A local maker of turret lathes and screw machines the past week, took orders for six machines for the Willys Corporation, Elizabeth, N. J.; eight for the Westinghouse Electric & Mfg. Co., Pittsburgh; three for the Domestic Electric Co., Cleveland, and eight for export to Spain. No inquiries have developed from the railroads in this section since the roads were restored to their owners.

It is expected that manufacturers of forging machinery will make a price advance on all lines of hot metal-working machinery March 15. An advance of 10 per cent was made Jan. 1.

Inquiries reaching local machinery houses include one from the Koppel Industrial Car & Equipment Co., Koppel, Pa., for a screw cutting double back geared lathe, 28-in. swing and 3-ft. between centers; one from the Alloy Parts Mfg. Co., Canton, Ohio, for a cut-off machine for piston rings and one from the Lewellen Mfg. Co., Columbus, Ind., for a drilling machine with tapping attachment, lathe with 16 to 24-in. swing and 10 ft. between centers and a punching and shearing machine to punch ⅝-in. holes in ⅝-in. steel and to cut off ½ x 4 in. bars.

The Grabler Mfg. Co., Cleveland, has purchased the plant of Winslow Brothers, Chicago, used in making shells during the war, and will equip it for the manufacture of malleable fittings. It will be placed in operation within two or three months and will constitute a unit of the Grabler Mfg. Co.

The Standard Parts Co. Cleveland, is carrying out the plans of the new management to dispose of certain branches and ultimately to concentrate its business near the center of operations, has sold its new spring plant at Flint, Mich., to R. T. Armstrong, the purchase price being approximately $900,000. It is stated that Mr. Armstrong purchased this plant on his own account rather than representing some automobile interest. The Standard Parts Co. in its refinancing plans, has arranged for a $6,000,000 loan to be taken by Cleveland and New York banks and investment security houses.

The Metals Welding Co., Cleveland, has acquired the electrolytic plant of the Burdette Oxygen Co., Lakeside Avenue and Thirty-third Street, consisting of a one-story building, 80 x 120 ft., and will operate it in connection with its present products, which include acetylene generators, lap welding and cutting outfits.

The Webler & Blanchard Automatic Machine Co., Cleveland, has increased its capital stock from $10,000 to $25,000.

The Union Metal Mfg. Co., Canton, Ohio, has commenced the erection of a foundry, 90 x 100 ft., which will be equipped for a daily capacity of 50 tons of castings.

The Dillon Electric Co., Canton, Ohio, will build a plant, 50 x 125 ft., in New Philadelphia, Ohio. It repairs and rebuilds electrical equipment.

The Bucyrus Malleable Castings Co., Bucyrus, Ohio, has been organized and will be incorporated with a capital stock of $200,000 to build a malleable iron foundry.

The Garford Mfg. Co., Elyria, Ohio, has changed its name to the General Phonograph Co.

The Miller Rubber Co., Akron, Ohio, will build a four-story addition, 97 x 250 ft.

The Fortune Tool Co., Wooster, Ohio, began operations in its new plant a few days ago. The present company recently purchased the machinery and business of the Lewis Tool Co., Detroit.

The Chalmers Pump Mfg. Co., Lima, Ohio, will erect a new foundry to replace the one recently burned.

The Powell Pressed Steel Co. recently organized in Youngstown, with a capital stock of $225,000 will build a plant in Hubbard, Ohio.

The recent increase in capital stock of the Bryan Screw Machine Products Co., Bryan, Ohio, is for the addition of new buildings and equipment.

The Atcheson Die Tool Co., Crumrine Building, Columbus, Ohio, is building an addition to its plant.

Cincinnati

CINCINNATI, March 8.

Machine tool manufacturers are well satisfied with the volume of business offering. While inquiries are not so numerous as during the past month, orders continue to come in at a very satisfactory rate. No large lists are before the trade though it is expected that several railroads, which are preparing lists will be in the market shortly. The Dayton Rubber Co., which is planning an extension to its plant, is understood to have made a large appropriation for equipment, and will likely be in the market soon with a list. The Oakland Motor Co. and the Standard Parts Co. were among purchasers the past week. The Ordnance Salvage Board, which disposed of nearly $2,000,000 worth of machine tools the past year, expects to clean up this part of its business within the next 30 days. At present it has on file 35 inquiries from educational institutions for from 15 to 30 tools each, but is unable to take care of this business as the tools are not available.

Metal manufacturing plants, other than machine tool builders, continue very busy, frog and switch companies reporting more business than they can take care of. One manufacturer of conveying machinery states that he has just received the largest order, to his knowledge, ever placed in this country for this class of material. It came from an Eastern rubber manufacturer. Foundries have more work than they can care for, with the result that large tonnages of castings are being placed outside the city.

It is reported that the John H. McGowan Co., pump manufacturer, Cincinnati, has purchased property in the Oakley district, and is contemplating the erection of a plant. Its present works are on Central Avenue.

The Monitor Stove & Range Co., Cincinnati, furnace manufacturer, has purchased 38 acres in Norwood, at a price said to be $120,000. It intends to construct a large furnace plant on this site and has engaged the Austin Co., Cleveland, to draw the plans. The company operates a number of works in the city, and it is for the purpose of centralizing its operations that the new plant is contemplated.

The Dayton Rubber Mfg. Co., Dayton, Ohio, has completed plans for an extension which will give it an additional 100,000 sq. ft. of floor space. An appropriation of $300,000 has been made to cover cost of construction and equipment. J. A. McMillan is president.

Bids are being asked for the sale of the property of the George B. Curd Co., car manufacturer, Norwood, Ohio, which includes a manufacturing building, machine and forge shops all fully equipped. Bids will be received by A. C. Roudebush, Mercantile Library Building, Cincinnati, until March 22.

The Columbus Anvil & Forging Co., Columbus, Ohio, has recently increased its capitalization from $60,000 to $100,000. Extensions to the plant are contemplated to take care of increasing business.

The Security Metal Products Co., Cincinnati, has been incorporated with a capitalization of $100,000. W. P. Anderson, of the Ferro-Concrete Construction Co., and V. L. Moeser are the incorporators.

The C. H. Weber Co., Cincinnati, is asking for bids for a new factory 125 x 130 ft., to be erected on Colerian Avenue. It will be one-story in front and three stories in the rear. Martin Fisher is the architect.

The Progressive Die & Tool Co., Columbus, Ohio, recently incorporated with a capital stock of $200,000, has plans under consideration for the erection of a factory, to be undertaken before its present lease expires. The company is purchasing equipment for its existing plant, which is turning out special machinery, dies, jigs, etc. H. F. Gray is president.

The Cincinnati Fixture Foundry Co., Cincinnati, has been incorporated with a capitalization of $30,000. It operates a foundry at Front and Main streets, its product consisting of special gray iron, brass, bronze and aluminum castings. Plans for the future have not been completed, but larger works are contemplated. Offices are at 123 East Sixth Street. H. L. Fruechtemeyer is president.

The Cooper Corporation, Cincinnati, has been organized to amalgamate the interests of the I. J. Cooper Rubber Co., the Cooper Battery Mfg. Co., Cincinnati, and the Grant Tire & Rubber Co., Findlay, Ohio. The erection of a large plant is contemplated. I. J. Cooper is president.

Ray Sims, acting for the Altoff Plating & Polishing Co., Columbus, Ohio, has let the contract for a new factory to Nonnenmacher & Frank, general contractors. It will be erected on North Grant Avenue and will cost about $60,000. Work will commence immediately.

The Dayton Iron & Steel Co., Dayton, Ohio, has increased its capital stock from $30,000 to $100,000. T. B. Ozias, who recently purchased the one-third interest formerly owned by the late George Schantz, has been made president.

The plant of the Elmwood Castings Co., St. Bernard, Ohio, was damaged by fire to the extent of $200,000 on March 6. Three buildings were practically destroyed, including the main factory, the new addition and the pattern shop. It has not yet been decided as to whether or not the plant will be rebuilt

The Cisco Machine Tool Co., Elmore Street, Cincinnati, is having plans prepared for a one-story extension, 50 x 150 ft.

The Warner Elevator Co., Cincinnati, manufacturer of elevators, has taken bids for a one-story addition, 40 x 175 ft.

The City Council, Dover Ohio, has plans under way for the erection of a municipal electric light and power plant to cost about $100,000, with equipment. Bids will be asked at an early date. George E. Arnold, New Philadelphia, Ohio, is the architect and engineer.

The Adams Axle Co., Findlay, Ohio, recently reorganized with a capital stock of $1,000,000 is planning for enlargements.

The Kenny Foundry Co., Mansfield, Ohio, is having plans prepared for a one-story foundry and machine shop, 90 x 200 ft.

The United States Engineers Department, Marietta, Ohio, is planning for the erection of a one-story machine shop, in connection with a new local station.

Milwaukee

MILWAUKEE, March 8.

The volume of orders booked by machine-tool builders the last week or two is indicative of growing conservatism among users in regard to undertaking new construction, not so much because of the cost of materials and equipment, but because of the exorbitant level to which labor is attempting to press wages in the building trades. The General Motors Corporation on March 1 stopped all construction work at the Samson Tractor Co. plant in Janesville, Wis., giving as reasons the scarcity and high cost of labor, scarcity and high prices of material, and shortage of housing accommodations. The large foundry unit stands little more than half completed. Pending a readjustment of conditions the Janesville works will continue as an assembling plant only.

While this tendency, should it become general, undoubtedly will have its effect upon the machine tool trade, makers and dealers believe a large aggregate of requirements will continue for equipping existing buildings and shop extensions erected in recent months and to make replacements. Most shops are sold up for three to five months ahead.

The H. W. Johns-Manville Co., 201-231 Clybourn Street, Milwaukee, has awarded the general contract to the Rauf Co., 53 Patton Building, local, for the construction of its new works at Waukegan, Ill., to supplant the present plant in Wauwatosa, suburb of Milwaukee. The investment at Waukegan will be about $6,000,000. Construction started March 1.

The Joliet Railway Supply Co., Chicago, affiliated with the Northwestern Malleable Iron Co., Milwaukee, has disposed of its works at Fortieth and Princeton streets and will erect a new plant costing $150,000 at Ninety-third and Archer streets, Chicago. Contracts have been awarded for two one-story brick and steel shops, each 80 x 100 ft. The principal product of the Joliet company is brake beams. F. L. Sivyer is president.

The Milwaukee Reliance Boiler Works, 1102 Thirty-second Street, Milwaukee, has plans by Armand D. Koch, architect and engineer, 1045 Wells Building, for a one-story sawtooth boiler shop addition, ell-shaped, 60 x 270 and 60 x 40 ft. Bids will be taken about March 15. John E. Sharp is president.

The Gisholt Machine Co., Madison, Wis., has broken ground for a one-story brick and steel addition, 113 x 300 ft., to increase its gray iron foundry capacity about 50 per cent. The Worden-Allen Co., Milwaukee, has taken the general contract. The work will cost about $75,000.

The Giddings & Lewis Mfg. Co., Fond du Lac, Wis., has changed its corporate style to Giddings & Lewis Machine Tool Co. It was originally established to manufacture sawmill machinery annd general wood-working equipment, but in the last few years has been making metal-working tools, which are now its principal product.

The Milwaukee Die Casting Co., 291-299 Fourth Street, Milwaukee, sustained a heavy loss by fire on Feb. 28, which gutted the plant and caused a temporary suspension of operations. It plans to rebuild.

The Northwest Engineering Works, Green Bay, Wis., has increased its authorized capital stock from $200,000 to $1,000,000. It expects to complete its contracts with the United States Shipping Board about April 1, and thereafter will manufacture portable cranes and hoists in addition to vessel construction and repairs.

The Casco Gravel Co., Casco, Wis., is purchasing new machinery and equipment costing about $20,000.

The Sheboygan Foundry Co., Sheboygan, Wis., is being organized by stockholders in the Sheboygan Machine Co., which will be the principal customer of a new gray iron shop, 40 x 108 ft., to be built immediately. Construction contracts have been awarded and equipment is being purchased. Alfred Steffen, Jr., is president and general manager.

The Hamilton Mfg. Co., Two Rivers, Wis., has increased its capital stock from $750,000 to $1,250,000. The plant, which manufactures metal and wood special furniture and fixtures for printing shops, physicians' offices, dental cabinets, etc., is undergoing enlargement and new equipment is being added. George S. Hamilton is president.

The Montana Tractor Co., Chicago, has accepted the offer of the Peshtigo, Wis., Development Club to provide a site for a branch factory, and will start work about April 1 on the erection of a one-story brick and steel assembling shop, 150 x 250 ft., estimated to cost $100,000 with equipment. Charles H. Haight, vice-president, is in charge of operations at Peshtigo.

The Northern Equipment Co., Milwaukee, has been incorporated with a capital stock of $10,000 to manufacture coal conveyors and other industrial appliances. H. C. Carter, John P. Donnelly and John M. Clarke, 2430 Wells Street, attorneys, appear as incorporators.

The Triner Scale Co., Chicago, is negotiating with the Commercial Club of Lake Geneva, Wis., for the transfer of its plant and offices, which will involve the erection and equipment of new buildings. The company is planning to establish a department for manufacturing aluminum utensils in addition to scales for the Postoffice Department and small cofputing scales for the economical market. James M. Triner is president.

The Wausau Abrasives Co., Wausau, Wis., has plans for a one-story brick and steel addition, 60 x 200 ft. J. K. Sawyer is manager.

The Board of Education, Bloomer, Wis., is taking bids until March 22 for a two-story brick and concrete high school, 100 x 120 ft., with manual training department. It will cost about $130,000. Carl Volkman, Eau Claire, Wis., is the architect.

The Langstadt & Meyer Co., Appleton, Wis., has increased its capital stock from $50,000 to $400,000. It is erecting a two-story machine shop, 60 x 120 ft., for manufacturing self-contained electro-generating systems. Its automotive electric service and contracting branches at Green Bay and Oshkosh, Wis., also are being enlarged.

The Chicago, Racine & Milwaukee Line, 184 Broadway, Milwaukee, will erect a four-story building, 125 x 440 ft., as an addition, duplicating its present dock and warehouse on Erie Street and the Milwaukee River. The upper floors will be equipped for light manufacturing. A. S. Hecht, 64 West Randolph Street, Chicago, is completing plans and will take bids.

The Badger Tool Co., Beloit, Wis., manufacturer of machine tools, has increased its capital stock from $25,000 to $175,000 to finance the construction and equipment of a factory and shop addition.

The Young America Electric Machine Co., West Bend, Wis., has plans for a two-story machine shop addition, 44 x 122 ft., and is in the market for some additional equipment. Frank Woodford is general manager.

The American Grinder Mfg. Co., 2203 Sycamore Street, Milwaukee, has increased its capital stock from $200,000 to $300,000. It has recently opened branch shops, at 1600 Clybourn Street and 718 Poplar Street.

The C. Hennecke Co., 1353 North Pierce Street, Milwaukee, is considering plans and estimates of a proposed new plant equipped as a fabricating and erecting shop, wire works, etc., on a 10-acre tract which it has acquired on the Port Washington Road. It contemplates an increase of 500 per cent in the capacity of the present works. No further details of the project are available. Otto Zielsdorf is president.

The Adjustable Door Stop Co., Kenosha, Wis., has been chartered with a capital stock of $25,000 to manufacture automatic door stops and other specialties, including automotive accessories. G. W. Skilbeck is president and chief owner.

The Johnson Specialty Co., 616 East Washington Avenue, Madison, Wis., has been organized by Orvey Johnson to manufacture a patented device for expanding piston rings and other appliances for automotive plants and garages.

The Optenberg Iron Works, Sheboygan, Wis., has broken ground for a series of shop additions which will increase its capacity 50 per cent by July 1. It is filling large orders for radial drills which require considerable new machine shop space and equipment. The structural fabricating and erecting shop, boiler and tank shop and flanging clamp shop will also be enlarged. New machinery will be installed for handling steel plate work over the present limit of ½-in. plate. About $75,000 will be invested in improvements.

The Kiel Machine Co., Kiel, Wis., has purchased two milling machines, a lathe and a 21-ft. radial drill from the Government Arsenal at Rock Island, which will furnish the nucleus of the equipment required for a machine shop addition to be erected in April.

The Holm Mfg. Co., Kenosha, Wis., has been incorporated with a capital stock of $50,000 and will erect a shop on Fairfield Avenue for the production of tools, dies, jigs, fixtures, special machinery, wood and metal patterns and similar devices. Operations will begin about April 15. The following officers have been elected: President, J. H. Holm; vice-president, H. A. Bowman; secretray-treasurer, L. E. Holm; general superintendent, W. C. Holm.

The Sheboygan Cigar Box Lumber & Mfg. Co., Sheboygan, Wis., has plans for the complete electrification of its factory which call for the erection of a new power house in combination with a machine shop, saw-filing and service room. New steam generating equipment, motors, etc., will be purchased. The improvements will cost about $50,000.

Detroit

DETROIT, March 8.

The Superior Machine & Engineering Co., 51 East Fort Street, Detroit, is taking bids up to March 15 for a new three-story plant, 100 x 120 ft., on East Larned Street, to cost about $100,000. Brown & Preston, 406 Empire Building, are architects.

The Buick Motor Co., Flint, Mich., has arranged a program to total about $10,000,000 for new construction during the present year. Of this amount $7,500,000 will be expended for new buildings and equipment at the local works, while the remainder, $2,500,000, will be used for an assembling plant at St. Louis. Nine new buildings will be constructed at Flint and other enlargements made to allow for a capacity of 550 automobiles per day. The St. Louis plant will be equipped to assemble 200 cars daily, the chassis units being sent to this point for assembling; bodies for the cars will be built at this latter works. H. H. Bassett is president.

The Upton Machine Co., St. Joseph, Mich., is having plans prepared for a one-story machine shop, 90 x 175 ft., to cost about $50,000.

The Detroit Belt Lacer Co., 27 A Street, Detroit, has completed plans for a new two-story plant, 60 x 100 ft., to cost about $35,000.

The Oakland Motor Car Co., Pontiac, Mich., has arranged for the erection of additions to its plant to cost about $3,000,000. Three new factory units will be constructed

to cost $2,500,000 with equipment; one will be equipped for assembling work and the others for general operations. It is proposed to develop a capacity of 320 cars a day and to have a portion of the new works ready for service early in July. A new administration building, construction of which has been inaugurated, is estimated to cost $500,000. Fred W. Warner is president.

The Superior Steel Castings Co., Benton Harbor, Mich., is arranging for the erection of a one-story plant, brick and steel, 130 x 440 ft., to cost about $200,000, with machinery. It will be equipped as a foundry, forge shop and for malleable iron work.

The Union Steel Products Co., Albion, Mich., has purchased the plant and business of the Parker Collapsible Rim Co., Chicago, and will move the machinery to Albion at once.

William Moulds, Benton Harbor, Mich., has incorporated his brass foundry under the style of the Moulds Brass Foundry Co., with $10,000 capital stock.

The Albion Bolt Co., Albion, Mich., will add to its production this spring by building an additional factory unit adjoining its present plant.

A site has been purchased for a new factory in Coopersville, Mich., for the manufacture of motor truck bodies and cabs and buildings will be erected immediately. Local capitalists are back of the new company, which has a capital stock of $8,000. The officers are: President, John H. Teravert; vice-president, L. J. Hinken; secretary-treasurer, William Van Allsburg; manager, Millard Bush.

The new plant of the Handley-Knight Co. at Kalamazoo, where a 40-acre site has been purchased, will be in operation by June 1, according to present plans. Contracts for the factory units have been placed calling for structures 80 ft. wide with an aggregate length of 800 ft.

The Lansing Stamping & Tool Co. has a half million dollars' worth of business on its books contracted since Jan. 1 and another half million in immediate prospect. The company began an expansion program last year and erected additions which enlarged its capacity 60 per cent. Its capital stock has been increased from $100,000 to $300,000 and the following officers and directors have been re-elected: President, Charles H. Lawrence; vice-president and general manager, Goerge F. Conway; secretary-treasurer, F. M. Odel; superintendent, George L. Robinson and Harry L. Stanton.

The Transport Truck Co., manufacturer of motor trucks, Mount Pleasant, Mich., has increased its capital stock from $1,000,000 to $5,000,000, with a view to enlarging its plant at once to increase production from 10 trucks per day to 20.

St. Louis

ST. LOUIS, March 8.

The plant of the Standard Oil Co. at Wood River, Ill., is to be enlarged at a cost of about $5,000,000, including equipment.

The Skinner Brothers Mfg. Co., St. Louis, manufacturer of blow pipe systems, will build a new factory with about 25,000 sq. ft. of floor area. The estimated cost will be $250,000 with equipment.

The Western Petroleum Refiners' Association, an independent organization, has plans for a pipe line from the Oklahoma fields, via St. Louis, to Chicago. E. E. Schock, of the Indiahoma Refining Co., St. Louis, is chairman of the committee in charge of the plan, which is backed by 11 independent concerns. Another pipe line will be built to New Orleans. The total cost will be about $10,000,000.

The Hussmann Refrigerating Co., St. Louis, will equip an addition, covering about two acres, for the manufacture of refrigerators.

The Surety Tire & Tube Co., Kienlen Avenue and Terminal Belt Line, William I. Burgess, president, St. Louis, will enlarge its facilities to effect a daily production of 5000 automobile tire casings. It is capitalized at $1,500,000.

The Alex. Kilpatrick & Sons Foundry Co., St. Louis, is reported in the market for equipment to replace that destroyed by fire causing a loss of $30,000.

The Lehmann Machine Co., 606 South Broadway, St. Louis, will build a new two-story factory for the manufacture of lathes. It will cover an entire city block.

The Bowen Motor Car Co., Title Guaranty Building, St. Louis, has acquired 21 acres adjoining the city on which it will erect a plant for the production of a gasoline-driven standard-gage railroad car. A. D. Bowen is president. The company has a capital stock of $1,000,000.

The Davidson Farmers' Gin Co., Davidson, Okla., J. A. Dickerson and others interested, is in the market for about $35,000 worth of cotton gin and power plant equipment.

The People's Electric Co., Marianna, Ark., M. D. Miller, president, is in the market for three 150-hp. boilers.

The Stamps Light & Power Co., Stamps, Ark., J. M. Hudgens, president, is in the market for about $20,000 worth of machinery.

The Friars Point Light, Water & Ice Co., Friars Point, Miss., M. C. Lyon, owner, will equip a power plant and buy about $180,000 worth of machinery.

The Perry Rotary Fixture Co., Meridian, Miss., Gus C. Kendall, president, will equip a plant to manufacture motors, speed changing devices, etc.

The St. Joseph Structural Steel Co., St. Joseph, Mo., has increased its capital stock by $125,000 and will enlarge its fabricating plant.

The Excel Tool Co., Garber, Okla., will install about $20,000 worth of machinery for the manufacture of tools.

The Robinson Packers Co., Tulsa, Okla., H. D. Parker, manager, will buy lathes, drill presses, saws and other equipment.

The Ragan Tank & Mfg. Co., Tulsa, Okla., B. F. Ragan, president, will equip a building for the manufacture of tanks.

The Hagna Producing & Refining Co., John W. Hagan, Tulsa, Okla., in charge, will equip a $1,000,000 refinery at Mansfield, La.

The St. Joseph Brewing Co., St. Joseph, Mo., will equip an ice-making plant requiring about $50,000 worth of machinery.

The Seaman-Packard Lumber Co., Fort Smith, Ark., W. L. Seaman, president, will equip a mill involving about $200,000 worth of machinery.

The Appalachian Corporation, New Orleans, La., Louis B. Magid, president, will install about $100,000 worth of overhead conveyor equipment and increase its warehouse capacity.

The Voss-Hutton Mfg. Co., Little Rock, Ark., M. C. Hutton, 622 East Markham Street, in charge, will equip a plant for the manufacture of saddlery and automobile accessories.

The plant of the Copper Clad Malleable Range Co., St. Louis, was burned March 6 with a loss of $100,000. It will be rebuilt.

The Attalla Oil & Fertilizer Co., Attalla, Ala., is considering plans for a new plant to cost about $150,000, including machinery, replacing the former works of the company, recently destroyed by fire.

The New Orleans Motor Truck Mfg. Co., 5300 Tchuopitoulas Street, New Orleans, La., is planning for the installation of equipment in an existing building for the establishment of a motor truck manufacturing plant. It will specialize in the production of 1½, 2½ and 3½-ton trucks. E. C. Patton is president.

The Central South

LOUISVILLE, March 8.

The Buzz Engineering Co., Louisville, manufacturer of deep well pumps and conveying equipment, has increased its capital stock from $50,000 to $100,000.

The Pittsburgh Fuel Co., 121 South Third Street, Louisville, is planning the installation of equipment for unloading coal cars. Charles O'Connor is vice-president and general manager. Baylor Hickman, Ewald Iron Co., has been made president.

The Badger Aluminum Co., Louisville, has increased its capial stock from $25,000 to $50,000. J. H. Parker is president.

The Visible Measure Gasoline Dispenser Co., Louisville, manufacturer of gasoline pumping devices, has filed notice of change of name to the Nicholson Co., at the same time increasing its capital stock from $100,000 to $400,000. The company is planning for the erection of an addition to its foundry and machine shop.

The L. & N. Storage Battery Co., Louisville, has been incorporated with a capital stock of $50,000 by M. Y. Middleton, Louisville; and John U. Field and George E. Goodwin, Lexington, Ky., to manufacture storage batteries and other electric equipment.

The D. T. Bohon Co., Harrodsburg, Ky., manufacturer of wagons, buggies, parts, etc., has increased its capital stock from $150,000 to $1,000,000. Plans are being prepared for a two-story addition, 80 x 200 ft.

The Raymond-Thompson Co., Louisville, has been incorporated with a capital stock of $100,000 by F. M. Thompson, M. E. Raymond and William F. Stockton, to manufacture automobile radiators and other metal products.

California

SAN FRANCISCO, March 2.

C. C. W. Haun, 180 Jessie Street, San Francisco, is having plans prepared for a one-story machine shop, at 125 West Eighth Street. E. E. Young, 251 Kearny Street, is the architect.

The Southern Pacific Railroad Co., 65 Market Street, San Francisco, has awarded a contract to the Standard Construction Co., Call Building, for a one-story shop at its Los Angeles yards, 160 x 170 ft., to cost about $60,000.

The Atlas Machine Works, Inc., Los Angeles, has been incorporated with a capital stock of $25,000 by Charles Zimmerman, H. C. McManus and F. C. Wheeler, to manufacture machinery and tools.

The Bureau of Yards & Docks, Navy Department, San Francisco, has called for bids for the construction of a new power plant and electric distributing system at San Diego, Cal., to cost about $150,000.

The Shehan Tool & Machine Co., 112 East Washington Street, Los Angeles, has been organized to manufacture machinery, tools, etc. W. E. Shehan, 4265 South Hoover Street, heads the company.

The Turlock Irrigation District, Turlock, Cal., has approved a bond issue of $4,000,000, for the construction of a hydroelectric power plant, dam and reservoir, and distributing system. Of this amount, $1,028,000 will be used for the electric power plant, including machinery.

The Thermo-Electric Co., Los Angeles, has been incorporated with a capital of $250,000 by Frank L. Burns, W. E. Tipton and Theodore Stensland, to manufacture electrical apparatus.

The Sierra & San Francisco Power Co., San Francisco, is arranging for the erection of a new electric generating plant on the South Fork of the Stanislaus River, Tuolumne County, with capacity of about 57,000 hp.

The National Ice & Cold Storage Co., Second and Market streets, Oakland, Cal., has completed plans for a three-story cold storage building at First and Market streets, to cost about $150,000, including equipment.

The Concrete Machinery Co., Los Angeles, will build a new one and two-story plant at Santa Fe Avenue and Fifteenth Street, 99 x 120 ft., to cost about $18,000. Construction will begin immediately.

The Pacific Fruit Express Co., San Francisco, Cal., a subsidiary of the Southern Pacific Railroad Co., is planning for the enlargement of its icing and pre-cooling plant at Colton, estimated to cost with equipment about $200,000.

The State Highway Department, Carson City, Nev., has completed plans for the erection of a new machine shop at Reno. C. C. Cottrell is State highway engineer.

L. S. Cobb & Co., Fresno, Cal., will build a two-story and basement service building and automobile repair works at Van Ness Avenue and Tuolumne Street, to cost about $75,000.

The Drayer & Hanson Co., 743 East Fourteenth Street, Los Angeles, has been organized to manufacture truck and automobile pleasure bodies, parts, etc. H. E. Drayer and Bert Hanson, head the company.

The Pacific Northwest

SEATTLE, March 2.

The buying impulse which characterized the year 1919 continues with a demand that is unprecedented and obstructed only by limited production and inadequate transportation facilities. Farming equipment is in active demand covering both new and second hand tools. Many grain elevators and mills have been planned for the early spring, with a good call for equipment.

The Grays Harbor Lumber Co. of Hoquiam, Wash. has purchased 400 acres on the Columbia River, near Vancouver, Wash., on which will be erected a lumber mill with a daily capacity of 1,500,000 ft.

J. J. Coughlan & Sons, Vancouver, B. C. will erect a drydock 110 x 750 ft. at a cost of $3,750,000.

The plant of the Russell Lumber Co., Billings, Mont., was destroyed in a recent fire with loss of $50,000. H. J. Russell manager, states it will be immediately rebuilt.

The Colville Valley Lumber Co., Colville, Wash., recently organized with a capital stock of $30,000, will remodel and re-equip the Central Mill & Lumber Co.'s plant. New equipment will include machinery for the manufacture of doors, windows, interior house finishings, etc.

Plans have been completed for the proposed packing plant to be built by Hunt Brothers in Salem, Ore. at a cost of $85,000. The main structure will be 150 x 250 ft. one story and basement.

Texas

AUSTIN, March 6.

William Holden, who recently located at Wichita Falls, from Vancouver, B. C., plans to build machine shops and has purchased a site.

The San Antonio Machine & Supply Co. has been granted a permit to erect a foundry. The building and equipment will cost about $100,000.

The St. Johns Oil & Refining Co. has moved its headquarters from Fort Worth to San Antonio and plans to build a refinery at Corpus Christi. It has a capital stock of $7,000,000. L. Johns is president.

Canada

TORONTO, March 8.

The demand for machinery and tools continues brisk and numerous inquiries are being received from all sections of the Dominion for practically all classes of equipment. According to the present outlook there will be no letup in the demand for many months. The recent large contracts awarded to Canadian railroad equipment companies have been further augmented.

The Chase Tractors Corporation, Toronto, is reported to have taken over the business throughout Canada of the Chase Motor Truck Co., Syracuse, N. Y. It has also secured a plant adjoining the Canadian National Exhibition grounds in Toronto, which will give it facilities on the main lines of the Canadian Pacific and Grand Trunk railroads. It is the intention to manufacture tractors in this plant for Great Britain as well as Canada. The new concern will have a capital stock of $1,000,000, 7 per cent cumulative preferred stock, of which $750,000 will be issued now, and $1,000,000 of common stock, all of which has been issued. The Montreal and Toronto groups connected with the new concern are: R. J. Cluff, president; T. P. Birchall, vice-president, both of Toronto; James Whalen, Senator Currie, R. M. Wolvin, and J. W. Norcross, Montreal. The management of the company will be in the hands of Cluff Brothers, Toronto.

The Imperial Rubber Products Co., Stratford, Ont., has been organized and will immediately erect a plant for the manufacture of rubber goods, and will ultimately go into the manufacture of automobile tires, etc. S. R. Vaslinder, Brantford, Ont., will be manager.

The Motor Products Corporation, Walkerville, Ont., is in the market for a power-punch press, similar to a Consolidated No. 5½.

Crane, Ltd., Montreal, manufacturer of plumbing, heating and engineering supplies, has purchased a site in Regina, Sask., where it will establish a branch plant.

The city of Ottawa, Ont., contemplates the erection of a garage and repair shop to cost $50,000.

The Canadian Tygard Engine Co. has awarded the general contract to Walter Snelling, 66 Hiawatha Road, Toronto, for the erection of a carbureter plant to cost $40,000. H. R. Watson is the architect and E. O. Ewing, engineer, 907 Excelsior Life Building, Toronto.

The Grand Trunk Pacific Railway has completed plans for extensions to its dock at Prince Rupert, B. C. It will be 860 ft. long and 173 ft. wide and will be equipped with tracks, traveling cranes, elevators, etc.

The Canada Needle Works, Georgetown, Ont., has acquired the F. W. Corey Needle Works, Hamilton, Ont., and is removing the plant to Georgetown. The capacity of the present works will be doubled by the erection of an addition.

William Ward, Lucan, Ont., is in the market for a 15-hp., three-phase, 25-cycle, 220-volt, 750-r.p.m. motor, complete with starter.

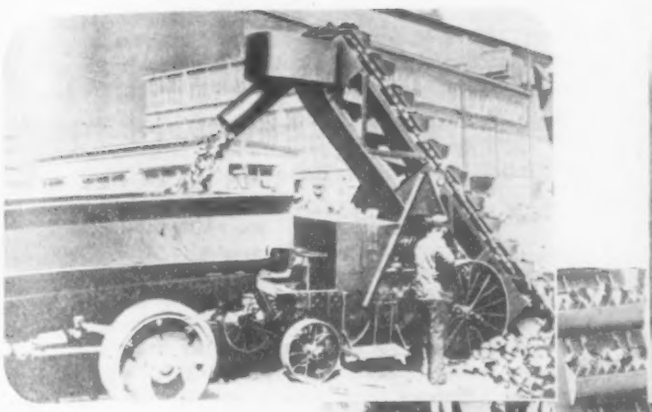
The Star Specialty Co., 661 Queen Street East, Toronto, is in the market for four No. 20 Bliss presses; eight small power presses; 80-in. gang press; 50-in. gang press; one double end shears; light bulldozer; two angle bending tables; three gas furnaces; 6 x 6-in. air compressor and tank; blower and tank, also enameling and tool room equipment.

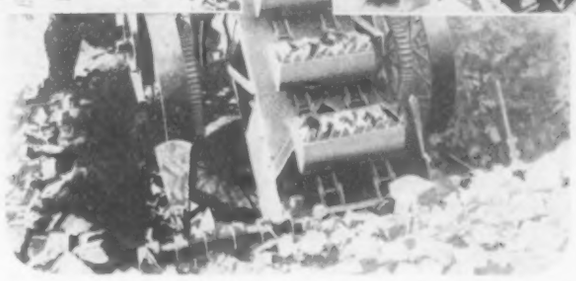
The Canada Foundries & Forgings, Ltd., Welland, Ont., is in the market for a 3½ or 4-ton upsetting machine.

Government Purchases

WASHINGTON, March 8.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, schedule 5702, opening March 12 for 1 projectile banding press for South Charleston; schedule 5703, for 1 boring and turning mill, 5704 for 3 milling machines and 5705 for 4 bench lathes, all for Newport opening March 19; schedule 5715, for 1 pattern-maker's lathe, 5716 for 1 surface grinder, 5719 for 2 milling machines, 5732 for 1 metal cutting band saw, 5737 for 1 surface grinding machine and magnetic chuck, 5738 for 14 bench grinders, all for Newport opening March 23.





SELF-PROPELLING WAGON LOADER AT THE PLANT OF THE UNITED STATES CAST IRON PIPE & FOUNDRY CO., BURLINGTON, N. J., LOADING DEBRIS FROM A DEMOLISHED CUPOLA. PADDLES DIG A PATH IN FRONT OF THE WHEELS SO THAT THE MACHINE CAN PROPEL ITSELF INTO THE MATERIAL. THE SWIVEL SPOUT ATTACHED TO THE LOADER CAN BE SWIVELED 180 DEG. THUS TO PERMIT THE MATERIAL TO BE DISCHARGED ON EITHER SIDE AS WELL AS IN FRONT OF THE MACHINE. THE DRIVE IS BY A 10-HP. GASOLINE ENGINE. THE LOADER IS BUILT BY THE GEORGE HAISS MFG. CO., INC., 141ST STREET AND RIDER AVENUE, NEW YORK.

NEW TRADE PUBLICATIONS

Rivetless Chain.—Wilmot Engineering Co., Hazelton, Pa. Catalog 19, 52 pages, 6 6¼ x 9 6¼ in. Concerned with Keystone rivetless chain for conveyors and elevators. The chain contains three parts, the center or Keystone link, the side links which are alike and interchangeable, and the connecting pin. Attachments for use with the chain such as troughs and buckets, chain sprockets, traction wheels, and other necessary equipment for conveyors and elevators are included. The chain and attachments are marketed by Frank W. Watts Co., Pennsylvania Building, Philadelphia.

Limit Stops for Direct Current Motors.—Electric Controller & Mfg. Co., Cleveland. Bulletin 1037-B. Illustrations and descriptions of a type B limit stop for direct current motors, the principal application being to prevent overtravel of the hook block on electric cranes. It is also applicable to door hoists, soaking pit covers, tilting furnaces, etc.

Turret Lathe.—Gisholt Machine Co., Madison, Wis. Pamphlet. Illustrations of the company's standard turret lathe, built in six sizes ranging from 13 in. to 41 in. in length.

Differential Hoists.—Clinton E. Hobbs Co., Boston, Mass. Pamphlet. Concerned with "Red Line" differential hoists. Differential blocks built in capacities of ⅛ to 3 tons, screw hoists of 500 to 30,000-lb. capacities, and two-part geared hoists for 500 to 8000 lb. are illustrated and described.

Air Compressors.—Sullivan Machinery Co., Chicago. A series of bulletins devoted to air compressors as follows: Bulletin 75-P describes single-stage, steam driven, straight line air compressors, built for standard pressures in capacities from 100 to 500 cu. ft. of free air per min., and which employ the improved "Wafer" air valves; bulletin 75-R, power-driven wafer valve air compressors, single stage, two-stage belted, and direct motor-driven, ranging in capacity from 50 to 470 cu. ft. and for standard pressures; bulletin 75-S, angle-compound power-driven air compressors, belt driven or direct connected; bulletin 75-T, portable air compressors, gasoline-engine driven, designed primarily for the operation of drilling tools for rock removal in highway construction; bulletin 75-U, tandem compound Corliss, steam driven, two-stage air compressors, available in unit capacities of 1000, 1500, 2000, 2500, 3150 cu. ft. free air per min. The bulletins are illustrated. A booklet, No. 121, of air compressors, shows the different sizes and types of air compressors built by the company. No attempt at description is made, the details shown in the tables merely covering the principal dimensions and power requirements. Each type shown in the booklet is covered by a complete bulletin.

Forge Hammers.—Sullivan Machinery Co., Chicago. Bulletin 72-D. Concerned with a utility forge hammer operated by compressed air or steam for general light forging work. Views of the hammer are included.

Drill Steel Furnace.—Sullivan Machinery Co., Chicago. Bulletin 74. Descriptions and illustrations of a drill steel furnace or forge operated by fuel oil or gas and designed for the safe, rapid and economical heating of rock drill and hammer drill steel.

Water Hammer Drill and Valveless Stopping Drills.—Sullivan Machinery Co., Chicago. Two bulletins. Bulletin 70-I illustrates and describes a water hammer drill adapted primarily for tunneling and drifting work in mines. It is rated to drill to a depth of 14 ft. without difficulty, and is mounted on a 4-in. bar or column arm. Bulletin 70-M describes valveless stopping drills made in lightweight and automatic rotating types, in both dry and water jet patterns.

Calendar.—Metal & Thermit Corporation, 120 Broadway, New York. Size, 28 x 44 in., with a calendar pad, 14 x 6 in. A railroad map of the United States, 26 x 19 in., showing time zones as of Jan. 1, 1919, is shown on the upper half of the calendar, and four half-tones showing thermit repairs to a broken sternpost of the U. S. transport "Northern Pacific," a curved crossing with welds at rail intersections, and welding a broken locomotive frame in place, are reproduced.

Welding and Cutting Torches.—Messer Welding Supply Corporation, 113 Eleventh Street, Brooklyn. Bulletin 51. Devoted to torches for welding cast iron, steel, brass, copper, aluminum and other metals; portable welding equipment, cutting torch, regulators for oxygen and acetylene, oxygen carbon removing torch, and preheating outfits of the hand pump type burning kerosene.

Gears.—Boston Gear Works, Norfolk Downs, Mass. Catalog. Lists an extensive line of standardized gears carried in stock, comprising 1200 sizes, including the standard styles of spurs, bevels, miters, spirals, helicals, worm gears and worms, sprockets, pinion wire and rack gears in brass, iron and steel. A new line of hardened steel spirals and hardened steel worms with threads ground and with extra long faces, also new sizes of thrust ball bearings for small size shafts, are included.

The United States Civil Service Commission will hold the following examinations: For an assistant fuel engineer in the Bureau of Mines at Pittsburgh, at $4,200 a year, and similar vacancies, application to be under form 2118, examination on April 6; for a junior mechanical engineer at the National Advisory Committee for Aeronautics, Langley Field, Va., at $1,800 a year, application under form 1312, examination April 13; for an assistant specification engineer in the office of the Chief Signal Officer, War Department, Washington, at $1,200 to $2,000 a year, application under form 2118, examination April 13; for a fuel research assistant in the Bureau of Mines for work throughout the United States at $1,200 to $1,800 a year, application under form 2118, examination April 13.

Damage estimated at $5,000 was done by fire recently, which broke out in the cupola room of the Woburn Iron Foundry, Woburn, Mass. A large number of patterns and molds were destroyed. The loss is covered by insurance. The building is owned by the Woburn Machine Co.

BOOK REVIEWS

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A chapter is devoted to various types of industrial ownership and is followed by several which show by means of diagrams and illustrations, various types of internal organization for industrial enterprises. Forms for planning, cost keeping, purchasing, storing and inspection purposes are incorporated, accompanied by suitable descriptive text.

Then comes a chapter devoted to the location, arrangement and construction of industrial plants in which the term industrial engineering is rather aptly defined. After this are chapters dealing with problems of employment, the compensation of labor, and corrective influences, which latter might be better termed welfare work. The closing chapter is a resume on the theories of management.

It seems to have been the author's purpose throughout to describe various ways of handling the same problem, namely, industrial organization, rather than to give a complete comprehensive plan embracing all the phases of an industrial enterprise. This present edition is the second, revised and enlarged, of the original work which appeared in 1913. E. C. R.

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This is the twentieth edition of this well-known work revised to bring it abreast of the latest and most approved practice. It is written for the practical workman in the language of the workshop and gives instructions on the use of all kinds of metal-working tools, both hand and machine, and tells how the work should be properly done. To the descriptions of cutting tools and their manipulation is added several new chapters on machine tools and their attachments.

The book is comprehensive in its scope, embracing lathe work, vise and bench work, drills and drilling, taps and dies, hardening and tempering, making and use of tools, tool grinding, marking out work, lathe attachments and their uses, machine tools, etc. The volume is valuable as a work of instruction and reference for both the machinist and apprentice.

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The subjects covered include a general description of forging tools, welding, calculation of stock for bent shapes, upsetting, drawing out and bending, simple forged work, calculation of stock; and making of general forgings, steam-hammer work, duplicate work, tool forging and tempering, and miscellaneous work. The usual tables of circumferences and areas of circles, decimal equivalents and heating temperatures, together with a course of exercises in forge work are included.

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The list of trade headings covers from the raw material to the finished article products connected with the electrical, engineering, hardware, iron, mechanical, mill, mining, quarrying, chemical, railroad, steel, architectural, contracting and kindred industries, and the firms listed cover producers, manufacturers, dealers and consumers. An excellent book for the sales and purchasing departments.

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SHORT TRADE ITEMS

The F. C. Austin Co., Inc., Chicago, and the Linderman Steel & Machine Co., Muskegon, Mich., have combined and will be taken over with the Municipal Engineering & Contracting Co., by the F. C. Austin Machinery Co., incorporated for the purpose. The new company will have about eight times the capacity of the former F. C. Austin Co. and will be one of the largest manufacturers of earth loading and cement making machinery. In the new corporation, F. C. Austin retires from active management and B. A. Linderman, president of the Linderman Steel & Machine Co. assumes control. The personnel of the plants remains substantially the same. The executive offices will be in the Railway Exchange Building, Chicago.

Early expansion on a large scale of the facilities of the Steacy-Schmidt Co., York, Pa., machinery manufacturer, has been announced, following a re-organization meeting. This re-organization took place following the purchase from the York Trust Co. of the J. W. Steacy estate holdings by H. W. Hardinge, of the Hardinge Co., New York, manufacturer of cement, mill and stone making machinery. Three and one-half acres of adjoining land has been purchased. At the re-organization meeting, William H. Baker, Montclair, N. J., was elected president; Harlow Hardinge, of New York, vice-president; R. B. T. Kiliani, White Plains, N. Y., secretary-treasurer.

Preparations are being made by the All Steel Supply Co., capital $250,000, to utilize a 12-acre site on the Lisbon branch of the Erie railroad near Niles, Ohio. The company was incorporated by J. E. Fitzgerald, formerly assistant general sales manager of the Brier Hill Steel Co. and A. E. Quere, in the sales department at Youngstown of the same concern. The company has taken possession of offices in the Niles postoffice building, formerly utilized by the Falcon Steel Co., which has moved to its plant in the western part of the city.

The Hoffman Products Co., Harrisburg, Pa., recently organized, manufacture the patented Hoffman oil-burner, for use industrially and in the home. A factory has already been leased in North Seventh Street, Harrisburg, and the manufacture of the burners on a small scale, has been started. The burner is the invention of William M. Hoffman, president of the company, which will soon seek a charter under Pennsylvania laws. Charles A. Clement is vice-president and treasurer. Major William B. Gray, is general manager.

The Foster-Johnson Reamer Co. of Elkhart, Ind., has been incorporated with a capitalization of $20,000, and is manufacturing the Johnson expansion reamers, which in the past have been manufactured by the Foster Machine Co. The directors of the new corporation are W. H. Foster, W. A. Kyte, W. T. Kough, Oscar Kylin and W B. Johnson, with W. H. Foster as president, W. B. Johnson as vice-president and Oscar Kylin as secretary.

The Pennsylvania-Ohio Electric Co., formerly the Mahoning & Shenango Railway & Light Co., which supplies electric power to a large number of industries in the Mahoning Valley, Ohio, including iron and steel producers, announces another large addition will be built this spring to its power generating station at Lowellville, Ohio. The addition will house another 20,000 h.p. unit, together with boilers and auxiliary equipment.

The International Steel & Iron Co., Evansville, Ind., has under contemplation extensive additions to its plant in that city. It has recently taken a contract from the Buick Motor Co., Flint, Mich., for 50 carloads of structural steel; 700 tons for bridges in Georgia, and 400 tons for a factory in northern Illinois. F. O. Weber is president.

The Norton Co., Worcester, Mass., announces that it will build 100 additional houses on its plot near its plant in Greendale. The new houses will be along the same plan as the 98 houses now about half completed. The 200 houses, when completed, will comprise Norton Village, and will represent an investment by the company of $1,200,000.

The Standard Supply & Equipment Co. of Philadelphia has purchased the entire capital stock of the Brierly-Lombard Co., Worcester, Mass., dealer in mill supplies. The general offices of the Standard company are in Philadelphia, and it also has offices and warehouses in Pittsburgh, Trenton and Altoona. It is intended to increase the territory and general scope of the Worcester business. J. T. Brierly, president and treasurer of the company, will retire from the active management of the business, but will remain on the board of directors. The Worcester manager has not been selected.

The Machined Steel Casting Co., Alliance, Ohio, advises that recent reports that it would double the capacity of its plant, are incorrect. The concerns is not contemplating any increase in capacity at this time. At present this concern is turning out about 40 tons of steel castings per day, its first heat having been poured on Dec. 24, last year. It expects by May or June to reach maximum capacity, which will be about 50 tons per day.

The Eastern Brass & Ingot Corporation, Waterbury, Conn., has added a new department to supply cast ingots of the exact analysis specified. Iron and other foreign substances will be eliminated by putting the chips through an intensive purification process. All shipments will be accompanied by an analysis sheet.

It is understood that the Barney & Smith Car Co., Dayton, Ohio, has been asked to bid on an order for cars from a railroad, which would total in the vicinity of $8,000,000 and keep the plant running for a period of four years. The name of the railroad was not divulged.

The Mono Corporation of America, 48 Coal & Iron Exchange, Buffalo, has purchased the entire stock of Mono apparatus and accessories from the F. D. Harger Co., Buffalo. F. D. Harger has not severed his connection, but will serve as general manager of the new corporation.

The Steel Sales Corporation, 129 South Jefferson street, Chicago, has purchased 34½ acres on the Chicago River at the northwest corner of Crawford Avenue and Thirty-fifth Street, upon which it will construct steel warehouses at a total cost of about $1,000,000.

The Sweet's Steel Co., Williamsport, Pa., and the West Branch Steel Co., Williamsport, Pa., manufacturers of steel and steel products, have merged and will operate under the name of the former concern. The combined facilities of these companies represent an investment of $900,000. John M. Young, of Williamsport, is treasurer.

The Queen City Supply Co., one of the leading mill, mine and factory supply houses of Cincinnati, has purchased additional ground adjoining its present location at Pearl and Elm streets, and contemplates additions to its premises to take care of its largely increased business.

The American Steam Conveyor Corporation has made arrangements with the Wellman Bibby Co., Ltd., 36 Kingsway, London, W. C. 2, England, to act as its representative in Great Britain and Ireland for the sale of the American steam ash conveyor, which the Wellman Bibby Co. will manufacture in England.

The recently organized York Ferroalloys Co., York, Pa., will quadruple its capital stock, the total capital being $200,000.

The Republic Iron & Steel Co. has awarded a contract to the McClintic-Marshall Co., Pittsburgh, for new steel buildings to house additional sheet mill units at the DeForest works, Niles, Ohio. Awards for electrical equipment have been made to the General Electric Co. The Alliance Foundry & Machine Co. will supply part of the rolling machinery.

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"Specifications for the Manufacture and Installation of Railroad Track Scales," circular 83 of the Bureau of Standards, Washington, affords plant owners definite and approved standards as the basis for securing scales adequate to meet modern weighing requirements. Copies may be obtained by request from the bureau

SHORT TRADE ITEMS

The F. C. Austin Co., Inc., Chicago, and the Linderman Steel & Machine Co., Muskegon, Mich., have combined and will be taken over with the Municipal Engineering & Contracting Co., by the F. C. Austin Machinery Co., incorporated for the purpose. The new company will have about eight times the capacity of the former F. C. Austin Co. and will be one of the largest manufacturers of earth loading and cement making machinery. In the new corporation, F. C. Austin retires from active management and B. A. Linderman, president of the Linderman Steel & Machine Co. assumes control. The personnel of the plants remains substantially the same. The executive offices will be in the Railway Exchange Building, Chicago.

Early expansion on a large scale of the facilities of the Steacy-Schmidt Co., York, Pa., machinery manufacturer, has been announced, following a re-organization meeting. This re-organization took place following the purchase from the York Trust Co. of the J. W. Steacy estate holdings by H. W. Hardinge, of the Hardinge Co., New York, manufacturer of cement, mill and stone making machinery. Three and one-half acres of adjoining land has been purchased. At the re-organization meeting, William H. Baker, Montclair, N. J., was elected president; Harlow Hardinge, of New York, vice-president; R. B. T. Kiliani, White Plains, N. Y., secretary-treasurer.

Preparations are being made by the All Steel Supply Co., capital $250,000, to utilize a 12-acre site on the Lisbon branch of the Erie railroad near Niles, Ohio. The company was incorporated by J. E. Fitzgerald, formerly assistant general sales manager of the Brier Hill Steel Co. and A. E. Quere, in the sales department at Youngstown of the same concern. The company has taken possession of offices in the Niles postoffice building, formerly utilized by the Falcon Steel Co., which has moved to its plant in the western part of the city.

The Hoffman Products Co., Harrisburg, Pa., recently organized, manufacture the patented Hoffman oil-burner, for use industrially and in the home. A factory has already been leased in North Seventh Street, Harrisburg, and the manufacture of the burners on a small scale, has been started. The burner is the invention of William M. Hoffman, president of the company, which will soon seek a charter under Pennsylvania laws. Charles A. Clement is vice-president and treasurer. Major William B. Gray, is general manager.

The Foster-Johnson Reamer Co. of Elkhart, Ind., has been incorporated with a capitalization of $20,000, and is manufacturing the Johnson expansion reamers, which in the past have been manufactured by the Foster Machine Co. The directors of the new corporation are W. H. Foster, W. A. Kyte, W. T. Kough, Oscar Kylin and W B. Johnson, with W. H. Foster as president, W. B. Johnson as vice-president and Oscar Kylin as secretary.

The Pennsylvania-Ohio Electric Co., formerly the Mahoning & Shenango Railway & Light Co., which supplies electric power to a large number of industries in the Mahoning Valley, Ohio, including iron and steel producers, announces another large addition will be built this spring to its power generating station at Lowellville, Ohio. The addition will house another 20,000 h.p. unit, together with boilers and auxiliary equipment.

The International Steel & Iron Co., Evansville, Ind., has under contemplation extensive additions to its plant in that city. It has recently taken a contract from the Buick Motor Co., Flint, Mich., for 50 carloads of structural steel; 700 tons for bridges in Georgia, and 400 tons for a factory in northern Illinois. F. O. Weber is president.

The Norton Co., Worcester, Mass., announces that it will build 100 additional houses on its plot near its plant in Greendale. The new houses will be along the same plan as the 98 houses now about half completed. The 200 houses, when completed, will comprise Norton Village, and will represent an investment by the company of $1,200,000.

The Standard Supply & Equipment Co. of Philadelphia has purchased the entire capital stock of the Brierly-Lombard Co., Worcester, Mass., dealer in mill supplies. The general offices of the Standard company are in Philadelphia, and it also has offices and warehouses in Pittsburgh, Trenton and Altoona. It is intended to increase the territory and general scope of the Worcester business. J. T. Brierly, president and treasurer of the company, will retire from the active management of the business, but will remain on the board of directors. The Worcester manager has not been selected.

The Machined Steel Casting Co., Alliance, Ohio, advises that recent reports that it would double the capacity of its plant, are incorrect. The concerns is not contemplating any increase in capacity at this time. At present this concern is turning out about 40 tons of steel castings per day, its first heat having been poured on Dec. 24, last year. It expects by May or June to reach maximum capacity, which will be about 50 tons per day.

The Eastern Brass & Ingot Corporation, Waterbury, Conn., has added a new department to supply cast ingots of the exact analysis specified. Iron and other foreign substances will be eliminated by putting the chips through an intensive purification process. All shipments will be accompanied by an analysis sheet.

It is understood that the Barney & Smith Car Co., Dayton, Ohio, has been asked to bid on an order for cars from a railroad, which would total in the vicinity of $8,000,000 and keep the plant running for a period of four years. The name of the railroad was not divulged.

The Mono Corporation of America, 48 Coal & Iron Exchange, Buffalo, has purchased the entire stock of Mono apparatus and accessories from the F. D. Harger Co., Buffalo. F. D. Harger has not severed his connection, but will serve as general manager of the new corporation.

The Steel Sales Corporation, 129 South Jefferson street, Chicago, has purchased 34½ acres on the Chicago River at the northwest corner of Crawford Avenue and Thirty-fifth Street, upon which it will construct steel warehouses at a total cost of about $1,000,000.

The Sweet's Steel Co., Williamsport, Pa., and the West Branch Steel Co., Williamsport, Pa., manufacturers of steel and steel products, have merged and will operate under the name of the former concern. The combined facilities of these companies represent an investment of $900,000. John M. Young, of Williamsport, is treasurer.

The Queen City Supply Co., one of the leading mill, mine and factory supply houses of Cincinnati, has purchased additional ground adjoining its present location at Pearl and Elm streets, and contemplates additions to its premises to take care of its largely increased business.

The American Steam Conveyor Corporation has made arrangements with the Wellman Bibby Co., Ltd., 36 Kingsway, London, W. C. 2, England, to act as its representative in Great Britain and Ireland for the sale of the American steam ash conveyor, which the Wellman Bibby Co. will manufacture in England.

The recently organized York Ferroalloys Co., York, Pa., will quadruple its capital stock, the total capital being $200,000.

The Republic Iron & Steel Co. has awarded a contract to the McClintic-Marshall Co., Pittsburgh, for new steel buildings to house additional sheet mill units at the DeForest works, Niles, Ohio. Awards for electrical equipment have been made to the General Electric Co. The Alliance Foundry & Machine Co. will supply part of the rolling machinery.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	4.50c.
Swedish bars, base price	20.00c.
Soft Steel	
¾ to 17/8 in., round and square	3.52c. to 4.25c.
1 to 6 in. x ⅜ to 1 in.	3.52c. to 4.25c.
1 to 6 in. x ¼ to 5/16	3.62c. to 4.35c.
Rods—⅝ and 11/16	3.57c. to 4.05c.
Bands—1½ to 6 by 3/16 to No. 8	4.22c. to 5.25c.
Hoops	4.47c. to 5.50c.
Shapes:	
Beams and channels—3 to 15 in.	3.47c. to 4.25c.
Angles:	
3 in. x ¼ in. and larger	3.47c. to 4.25c.
3 in. x 3/16 in. and ⅛ in.	3.72c. to 4.60c.
1½ to 2½ in. x ⅛ in.	3.52c. to 4.40c.
1½ to 2¾ in. x 3/16 in. and thicker	3.47c. to 4.35c.
1 to 1¼ in. x 3/16 in.	3.52c. to 4.40c.
1 to 1¼ x ⅛ in.	3.57c. to 4.45c.
⅞ x ⅞ x ⅛ in.	3.62c. to 4.50c.
¾ x ⅛ in.	3.67c. to 4.55c.
⅝ x ⅛ in.	4.07c. to 5.35c.
½ x 3/32 in.	5.17c. to 6.05c.
Tees:	
1 x ⅛ in.	3.87c. to 4.75c.
1¼ in. x 1¼ x 3/16 in.	3.77c. to 4.65c.
1½ to 2½ x 3/16 in. and thicker	3.57c. to 4.45c.
3 in. and larger	3.52c. to 4.30c.

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	3.52c. to 4.25c.
Toe calk, ½ x ⅝ in. and larger	4.60c. to 4.85c.
Open-hearth spring steel	7.00c.
Standard cast steel, base price	14.00c.
Extra cast steel	18.00c. to 20.00c.
Special cast steel	23.00c. to 25.00c.

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c. to 4.50c.

Sheets

Blue Annealed

	Per lb.
No. 10	5.07c. to 6.25c.
No. 12	5.12c. to 6.30c.
No. 14	5.42c. to 6.35c.
No. 16	5.52c. to 6.45c.

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	6.80c. to 8.80c.	—
Nos. 22 and 24	6.85c. to 8.85c.	9.80c.
No. 26	6.90c. to 8.90c.	9.85c.
No. 28	7.00c. to 9.00c.	10.00c.
No. 30	7.10c. to 9.10c.	—

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per lb.
No. 14	7.25c. to 9.00c.
No. 16	7.50c. to 9.25c.
Nos. 18 and 20	7.65c. to 9.40c.
Nos. 22 and 24	7.80c. to 9.55c.
No. 26	7.95c. to 9.70c.
No. 27	8.10c. to 9.85c.
No. 28	8.25c. to 10.00c.
No. 30	8.75c. to 10.50c.

No. 28, 36 in. wide, 20c. higher.

Pipe

Standard—Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
½ in. Butt...	—36	—19	¾-1½ in. Butt	—18	+2
¾-3 in. Butt.	—40	—24	2 in. Lap.....	— 9	+9
3½-6 in. Lap.	—35	—20	2½-6 in. Lap..	—11	+6
7-12 in. Lap..	—25	— 8	7-12 in. Lap...	+ 2	+20

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per lb.
Bright basic	8.00c.
Annealed soft	8.00c.
Galvanized annealed	8.50c.
Coppered basic	8.50c.
Tinned soft Bessemer	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE	
High Brass Sheet	28¼c. to 29½c.
High Brass Wire	28¼c. to 29½c.
Brass Rod	26¾c. to 29 c.
Brass Tube	42½c. to 44½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb...	$9.80	$9.55
		90 lb...	9.90	9.65
		100 lb...	10.00	9.75
1C...$15.00	$13.00	IC...	10.25	10.00
1X... 17.25	15.00	IX...	11.25	11.00
1XX... 19.00	16.75	IXX...	12.25	12.00
1XXX... 20.75	18.50	IXXX...	13.25	13.00
IXXXX... 22.25	20.25	IXXXX...	14.25	14.00

Terne Plates

8-lb. Coating 14x20

100 lb.	$9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	65c.
Bar	70c. to 80c.

Copper

Lake ingot	21c. to 22c.
Electrolytic	20c. to 21c.
Casting	19½c. to 20c.

Spelter and Sheet Zinc

Western spelter	10½c. to 11½c.
Sheet zinc, No. 9 base, casks	14c. open 14½c.

Lead and Solder*

American pig lead	10c. to 11c.
Bar lead	11c. to 11½c.
Solder ½ and ½ guaranteed	43c.
No. 1 solder	40c.
Refined solder	36c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb.	50c.

Antimony

Asiatic	12½c. to 13c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	35c. to 38c.

Old Metals

This has been a very dull week among dealers, the decline in ingot prices having discouraged buying, though values were generally unchanged. Dealers' buying prices are as follows:

	Cents Per lb.
Copper, heavy and crucible	16.75
Copper, heavy and wire	16.00
Copper, light and bottoms	14.50
Brass, heavy	10.50
Brass, light	7.75
Heavy machine composition	15.75
No. 1 yellow brass turnings	9.75
No. 1 red brass or composition turnings	12.75
Lead, heavy	7.50
Lead, tea	6.00
Zinc	5.50

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